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Material Cards

Each material screened as part of the ReCon Soil project has a dedicated Material Card. These Material Cards provide:

- An optical image & a microscopy image of the material
- A table detailing key properties of the material: density, organic matter content, total nitrogen content, total hydrogen content and C:N ratio
- A visual depictions of proportions of non-carbon, inorganic carbon, organic carbon and the proportions of relatively unstable organic carbon and relatively unstable organic carbon

Values stated are per unit dry mass of material

Material Highlights ascribe organic matter contents, organic carbon content and carbon stability to bands of very low, low, moderate, high and very high. For each category the boundaries are defined below:





UK GREEN WASTE COMPOST (UK GWC)

Material Highlights

Moderate organic matter
 Moderate organic carbon
 Moderate carbon stability

Key Properties

Density	Organic Matter	Total N	Total H	C:N ratio
(g cm ⁻³)	(% _{dry matter})	(% _{dry matter})	(% _{dry matter})	
0.51	39.4 ± 0.7	1.5 ± 0.2	2.5 ± 0.2	14:1







CATE COMPOST optical Image Microscopy (FR GWC) **Material Highlights** mage Moderate organic matter Moderate organic carbon Low carbon stability 1mm 2mm 3mm 1cm 2cm 3cm

Carbon Stability



Density	Organic Matter	Total N	Total H	C:N ratio
(g cm ⁻³)	(% _{dry matter})	(% _{dry matter})	(% _{dry matter})	
0.57	31.7 ± 2.1	3.0 ± 0.3	2.3 ± 0.1	6:1

Key Properties



Carbon Stability

Inorganic C

0.5%

Organic C 3.7%

Non-C 95.8%

Relatively unstable

OC 1.7%

CC 2.0%

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Optical Image Microscopt True 2cm 3cm microscopt Material Highlights Low organic matter Low organic carbon Low carbon stability

Key Properties

Density (g cm ⁻³)	Organic Matter (% _{dry matter})	Total N (% _{dry matter})	Total H (% _{dry matter})	C:N ratio
0.75	10.8 ± 1.3	BLD*	0.5 ± 0.2	-



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Optical Ingge Microsoft Microsoft Material Highlights Ingge Ingge

Key Properties



Carbon Stability

Density	Organic Matter	Total N	Total H	C:N ratio
(g cm ⁻³)	(% _{dry matter})	(% _{dry matter})	(% _{dry matter})	
0.66	14.3 ± 1.9	BLD*	0.5 ± 0.1	-





Key Properties



Density	Organic Matter	Total N	Total H	C:N ratio
(g cm⁻³)	(% _{dry matter})	(% _{dry matter})	(% _{dry matter})	
0.60	30.6 ± 7.5	BLD*	0.7 ± 0.1	-



GREENWORLD GREEN WASTE COMPOST (GW GWC)



Material Highlights

- Moderate organic matterHigh organic carbon
- Moderate carbon stability

Key Properties

In	organic C 3.8%
Organic	
Non-C 71.9% 24.39	Relatively stable OC 10.3%

Density	Organic Matter	Total N	Total H	C:N ratio
(g cm ⁻³)	(% _{dry matter})	(% _{dry matter})	(% _{dry matter})	
0.43	47.9 ± 2.3	1.8 ± 0.1	3.4 ± 0.5	16:1



COMPOSTED BARK (CB)



Material Highlights

Very high organic matter
High organic carbon
High carbon stability

Key Properties



Density	Organic Matter	Total N	Total H	C:N ratio
(g cm ⁻³)	(% _{dry matter})	(% _{dry matter})	(% _{dry matter})	
0.27	88.6 ± 0.9	0.8 ± 0.1	4.2 ± 0.1	55:1



MAURICE MASON ANAEROBIC DIGESTATE (MM AD)



Material Highlights

Very high organic matter
High organic carbon
Low carbon stability

Key Properties



Density	Organic Matter	Total N	Total H	C:N ratio
(g cm⁻³)	(% _{dry matter})	(% _{dry matter})	(% _{dry matter})	
0.22	83.0 ± 0.3	2.4 ± 0.2	5.0 ± 0.04	17:1



PAPER CRUMBLE (PC)



Material Highlights

Moderate organic matter
 Low organic carbon
 Low carbon stability

Key Properties

	Inorganic C 11.6%	R	elatively unstabl OC 3.9%	e
Non-C 79.8%	Organic C 8.6%		Relatively stable OC 4.7%	

Density	Organic Matter	Total N	Total H	C:N ratio
(g cm ⁻³)	(% _{dry matter})	(% _{dry matter})	(% _{dry matter})	
0.74	23.5 ± 0.1	0.5 ± 0.1	1.7 ± 0.1	44:1



Carbon Stability

Organic C

77.8%

Inorganic C 1.4% __

Non-C 20.8%

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HARDWOOD OAK BIOCHAR (HW BC)

Material Highlights

Very high organic matter
Very high organic carbon
Very high carbon stability

Key Properties

Density	Organic Matter	Total N	Total H	C:N ratio
(g cm ⁻³)	(% _{dry matter})	(% _{dry matter})	(% _{dry matter})	
0.34	93.9 ± 0.3	0.6 ± 0.02	1.3 ± 0.04	127:1



Relatively unstable OC 3.3%

Relatively stable

OC 74.5%



Carbon Stability

Organic C

78.8%

Inorganic C

0.0%

Non-C 21.2%

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SOFTWOOD BD (CUØ) BIOCHAR (SW BC)

Material Highlights

Very high organic matter
Very high organic carbon
Very high carbon stability

Key Properties

Density	Organic Matter	Total N	Total H	C:N ratio
(g cm ⁻³)	(% _{dry matter})	(% _{dry matter})	(% _{dry matter})	
0.16	100.0 ± 1.4	0.5 ± 0.1	1.3 ± 0.7	168:1



Relatively unstable

OC 5.2%

Relatively stable

OC 73.6%









Density	Organic Matter	Total N	Total H	C:N ratio
(g cm ⁻³)	(% _{dry matter})	(% _{dry matter})	(% _{dry matter})	
0.62	72.8 ± 1.1	0.8 ± 0.1	2.4 ± 0.1	58:1



optical Image Micro	UK BIOCHA (UK BC
	Material Highlights
1cm 2cm 3cm	 Very high organic matter High organic carbon High carbon stability
Carbon Stability	



Density	Organic Matter	Total N	Total H	C:N ratio
(g cm ⁻³)	(% _{dry matter})	(% _{dry matter})	(% _{dry matter})	
0.52	73.5 ± 1.6	1.3 ± 0.1	1.6 ± 0.1	43:1







1cm

Non-C 99.6%

2cm

Organic C

0.3%

Carbon Stability

Inorganic C

0.1%

3cm

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SHARP SAND (SS) (SS) (SS)

1mm 2mm 3mm

Key Properties











Density	Organic Matter	Total N	Total H	C:N ratio
(g cm ⁻³)	(% _{dry matter})	(% _{dry matter})	(% _{dry matter})	
0.99	27.5 ± 1.0	0.3 ± 0.02	2.2 ± 0.2	46:1



Carbon Stability

Organic C

0.1%

Non-C 99.9%

Inorganic C 0.0% This material sheet, and the information contained herein, was produced by L Mao and B.J. Reid of the University of East Anglia. For the record, these are our own results. The use of this material sheet, and the information contained herein, is permitted for scientific research and general public use only. The use of this material sheet, and the information contained herein, for commercial gain or priofit without permission of the original authors is prohibited. Copyright rests with the original authors. Reproduction of the material sheet, and the information contained herein, is prohibited unless written permission is obtained from the original authors.

QUARRY MINERAL SLUDGE (QMS)



Low organic matter
Very low organic carbon
Very low carbon stability

Key Properties

Density	Organic Matter	Total N	Total H	C:N ratio
(g cm ⁻³)	(% _{dry matter})	(% _{dry matter})	(% _{dry matter})	
1.07	4.3 ± 0.1	0.04 ± 0.03	1.0 ± 0.03	2:1



OC 0.0%

elatively stable

OC 0.1%



EXCAVATED CLAY SOIL (ExS)



Material Highlights

Low organic matter
Very low organic carbon
Very low carbon stability

Key Properties

	Inorganic C 0.1%	Relatively unstable OC 0.1%
Non-C 99.6%	Organic C 0.3%	Relatively stable OC 0.2%

Density	Organic Matter	Total N	Total H	C:N ratio
(g cm ⁻³)	(% _{dry matter})	(% _{dry matter})	(% _{dry matter})	
0.83	4.0 ± 0.3	0.1 ± 0.02	0.7 ± 0.01	3:1



optical Image

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TREATED SEDIMENT (TS)



Material Highlights

Low organic matter
Low organic carbon
Low carbon stability

Key Properties

	Inorganic C 0.7%	Relatively unstable OC 1.5%
Non-C 93.4%	Organic C 5.9%	Relatively stable OC 4.4%
		004.4%

Density	Organic Matter	Total N	Total H	C:N ratio
(g cm ⁻³)	(% _{dry matter})	(% _{dry matter})	(% _{dry matter})	
1.12	6.0 ± 0.8	0.6 ± 0.1	0.7 ± 0.04	11:1



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MIXED HARDWOOD SAWDUST (MHS)



Very high organic matter
High organic carbon
Low carbon stability

Key Properties

Density	Organic Matter	Total N	Total H	C:N ratio
(g cm ⁻³)	(% _{dry matter})	(% _{dry matter})	(% _{dry matter})	
0.26	100.0 ± 3.1	1.2 ± 0.1	4.2 ± 0.2	38:1







optical Image

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AGRICULTURAL RESIDUES (COMPOST LIKE OUTPUT) (CLO AR)



Material Highlights

Moderate organic matter
Low organic carbon
Low carbon stability

Key Properties

	Inorganic C 1.4% Relatively unstable OC 2.6%	
Non-C 90.2%	Organic C 8.4% Relatively stable	
	OC 5.8%	

Density	Organic Matter	Total N	Total H	C:N ratio
(g cm ⁻³)	(% _{dry matter})	(% _{dry matter})	(% _{dry matter})	
0.86	14.7 ± 1.3	0.6 ± 0.1	1.2 ± 0.1	16:1



BRASH CHIPPINGS (BRC)



Material Highlights

Very high organic matter
High organic carbon
Moderate carbon stability

Key Properties

	Inorganic 3.3%	C
		Relatively unstable OC 16.3%
Non-C 68.9%	Organic C 27.8%	
		Relatively stable OC 11.5%

Density	Organic Matter	Total N	Total H	C:N ratio
(g cm ⁻³)	(% _{dry matter})	(% _{dry matter})	(% _{dry matter})	
0.32	58.7 ± 5.7	1.2 ± 0.1	4.0 ± 0.2	26:1



Key Properties



Density	Organic Matter	Total N	Total H	C:N ratio
(g cm ⁻³)	(% _{dry matter})	(% _{dry matter})	(% _{dry matter})	
0.51	98.2 ± 0.3	3.6 ± 0.2	5.3 ± 0.1	12:1



COFFEE GROUNDS (CG)



Material Highlights

Very high organic matter
High organic carbon
Low carbon stability

Key Properties



Density	Organic Matter	Total N	Total H	C:N ratio
(g cm ⁻³)	(% _{dry matter})	(% _{dry matter})	(% _{dry matter})	
0.45	100.0 ± 27.6	3.2 ± 0.1	5.6 ± 0.04	15:1



Non-C 56.6%

40.5%

elatively stabl OC 10.6% This material sheet, and the information contained herein, was produced by L. Mao and B.J. Reid of the University of East Anglia. For the record, these are our own results. The use of this material sheet, and the information contained herein, is permitted for scientific research and general public use only. The use of this material sheet, and the information contained herein, is permitted for scientific research and general public use only. The use of this material sheet, and the information contained herein, is permitted for scientific research and general public use only. The use of this material sheet, and the information contained herein, is prohibited. Copyright rests with the original authors. Reproduction of the material sheet, and the information contained herein, is prohibited our science of the original authors is provided from the original authors.

 3.8 ± 0.3

 4.1 ± 0.1

11.1



0.18

 90.4 ± 1.5



SUB SOIL PEAT (SSP)



Material Highlights

Moderate organic matter
 Moderate organic carbon
 Low carbon stability

Key Properties



Density	Organic Matter	Total N	Total H	C:N ratio
(g cm ⁻³)	(% _{dry matter})	(% _{dry matter})	(% _{dry matter})	
0.73	47.5 ± 5.3	1.2 ± 0.04	2.4 ± 0.1	18:1







TOPSOIL (WH TS)



Material Highlights

Moderate organic matter
Low organic carbon
Low carbon stability

Key Properties



Density	Organic Matter	Total N	Total H	C:N ratio
(g cm ⁻³)	(% _{dry matter})	(% _{dry matter})	(% _{dry matter})	
0.67	30.6 ± 7.5	0.4 ± 0.02	0.7 ± 0.03	16:1



SURFACE HORIZON AGRICULTURAL SOIL (SHS)



Material Highlights

Low organic matter
Low organic carbon
Very low carbon stability

Key Properties



Density	Organic Matter	Total N	Total H	C:N ratio
(g cm ⁻³)	(% _{dry matter})	(% _{dry matter})	(% _{dry matter})	
1.13	2.3 ± 0.1	0.1 ± 0.01	0.3 ± 0.03	35:1



DEEP HORIZON AGRICULTURAL SOIL (DHS)



Material Highlights

Low organic matter
Very low organic carbon
Very low carbon stability

Key Properties



Carbon Stability

Density	Organic Matter	Total N	Total H	C:N ratio
(g cm ⁻³)	(% _{dry matter})	(% _{dry matter})	(% _{dry matter})	
1.14	3.2 ± 0.3	BLD*	0.3 ± 0.03	-