

Control Laboratories

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Account No:
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 Batch:
 Jan 2017 B
 CODE:
 BioChar IBI

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Date Received: 1/9/2017
 Sample ID: Walnut Shells
 Lab ID. Number: 7010190-01

International BioChar Initiative (IBI) Laboratory Tests for Certification Program

	Dry Basis Unless Stated: Range	Units	Method
Moisture (time of analysis)	20.5	% wet wt.	ASTM D1762-84 (105c)
Bulk Density	18.7	lb/cu ft	
Organic Carbon	91.5	% of total dry mass	Dry Combust-ASTM D 4373
Hydrogen/Carbon (H:C)	0.58 0.7 Max	Molar Ratio	H dry combustion/C(above)
Total Ash	4.1	% of total dry mass	ASTM D-1762-84
Total Nitrogen	0.93	% of total dry mass	Dry Combustion
pH value	9.63	units	4.11USCC:dil. Rajkovich
Electrical Conductivity (EC20 w/w)	0.210	dS/m	4.10USCC:dil. Rajkovich
Liming (neut. Value as-CaCO3)	7.9	%CaCO3	AOAC 955.01
Carbonates (as-CaCO3)	1.7	%CaCO3	ASTM D 4373
Butane Act.	2.1	g/100g dry	ASTM D 5742-95
Surface Area Correlation	201	m2/g dry	G

All units mg/kg dry unless stated:		Range of		Reporting		Particle Size Distribution		
	Results	Max. Levels	Limit (ppm)	Method	Results	Units	Method	
Arsenic (As)	ND	13 to 100	0.54	J	< 0.5mm	4.9 percent	F	
Cadmium (Cd)	ND	1.4 to 39	0.22	J	0.5-1mm	8.8 percent	F	
Chromium (Cr)	37.4	93 to 1200	0.54	J	1-2mm	24.8 percent	F	
Cobalt (Co)	1.2	34 to 100	0.54	J	2-4mm	31.5 percent	F	
Copper (Cu)	22.9	143 to 6000	0.54	J	4-8mm	23.4 percent	F	
Lead (Pb)	1.1	121 to 300	0.22	J	8-16mm	6.7 percent	F	
Molybdenum (Mo)	4.9	5 to 75	0.54	J	16-25mm	0.0 percent	F	
Mercury (Hg)	0.002	1 to 17	0.001	EPA 7471	25-50mm	0.0 percent	F	
Nickel (Ni)	24.8	47 to 420	0.54	J	>50mm	0.0 percent	F	
Selenium (Se)	ND	2 to 200	1.08	J	Basic Soil Enhancement Properties			
Zinc (Zn)	59.5	416 to 7400	1.08	J	Total (K)	12848 mg/kg	E	
Boron (B)	41.1	Declaration	5.40	TMECC	Total (P)	1913 mg/kg	E	
Chlorine (Cl)	163	Declaration	20.0	TMECC	Ammonia (NH4-N)	8.6 mg/kg	A	
Sodium (Na)	ND	Declaration	539.8	E	Nitrate (NO3-N)	1.1 mg/kg	A	
Iron (Fe)	2379	Declaration	27.0	E	Organic (Org-N)	9323 mg/kg	Calc.	
Manganese (Mn)	71	Declaration	0.54	J	Volatile Matter	20.6 percent dw	D	

* "ND" stands for "not detected" which means the result is below the reporting limit.

Method A Rayment & Higginson	E EPA3050B/EPA 6010	J EPA3050B/EPA 6020
B Enders & Lehmann	F ASTM D 2862 Granular	
C Wang after Rajan	G Butane Activity Surface Area Correlation Based on McLaughlin, Shields, Jagiello, & Thiele's 2012 paper: Analytical Options for Biochar Adsorption and Surface Area	
D ASTM D1762-84		

Analyst: Nik Zumberae

