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Batch: JUN 24 A
CODE: BioChar IBI

Pat Sherren
Metzler Forest Products (Warriors Mark)
1588 Ridge Road
Warriors Mark, PA 16877

* Particle distribution is approximate for unscreened material

Date Received: 5/30/2024
Sample ID: Metzler pureCHAR chip 2024-05-28
Lab ID. Number: 4050731-01

International BioChar Initiative (IBI) Laboratory Tests for Certification Program

Dry Basis Unless Stated:		Range	Units	Method
Moisture (time of analysis)	10.9		% wet wt.	ASTM D1762-84 (105c)
Bulk Density	10.3		lb/cu ft	
Organic Carbon	92.2		% of total dry mass	Dry Combust-ASTM D 4373
Hydrogen/Carbon (H:C)	0.17	0.7 Max	Molar Ratio	H dry combustion/C(above)
Total Ash	2.1		% of total dry mass	ASTM D-1762-84
Total Nitrogen	0.71		% of total dry mass	Dry Combustion
pH value	9.54		units	4.11USCC:dil. Rajkovich
Electrical Conductivity (EC20 w/w)	0.132		dS/m	4.10USCC:dil. Rajkovich
Liming (neut. Value as-CaCO3)	8.0		%CaCO3	AOAC 955.01
Carbonates (as-CaCO3)	3.1		%CaCO3	ASTM D 4373
Butane Act.	5.1		g/100g dry	ASTM D 5742-95
Surface Area Correlation	295		m2/g dry	G

All units mg/kg dry unless stated:		Results	Range of Max. Levels	Reporting Limit (ppm)	Method
Arsenic	(As)	**ND**	13 to 100	0.50	J
Cadmium	(Cd)	**ND**	1.4 to 39	0.20	J
Chromium	(Cr)	55.4	93 to 1200	0.50	J
Cobalt	(Co)	0.81	34 to 100	0.50	J
Copper	(Cu)	2.5	143 to 6000	0.50	J
Lead	(Pb)	**ND**	121 to 300	0.20	J
Molybdenum	(Mo)	**ND**	5 to 75	0.50	J
Mercury	(Hg)	**ND**	1 to 17	0.001	EPA 7471
Nickel	(Ni)	23.7	47 to 420	0.50	J
Selenium	(Se)	**ND**	2 to 200	1.00	J
Zinc	(Zn)	7.3	416 to 7400	1.00	J
Boron	(B)	12.1	Declaration	5.0	TMECC
Chlorine	(Cl)	52.1	Declaration	20.0	TMECC
Sodium	(Na)	**ND**	Declaration	500	E
Iron	(Fe)	361	Declaration	25.0	E
Manganese	(Mn)	651	Declaration	0.50	J

Particle Size Distribution *	Results	Units	Method
< 0.5mm	0.4	percent	F
0.5-1mm	0.2	percent	F
1-2mm	1.5	percent	F
2-4mm	18.1	percent	F
4-8mm	55.0	percent	F
8-16mm	24.8	percent	F
16-25mm	0.0	percent	F
25-50mm	0.0	percent	F
>50mm	0.0	percent	F

Basic Soil Enhancement Properties			
Total (Ca)	4246	mg/kg	E
Total (Mg)	311	mg/kg	E
Total (K)	2502	mg/kg	E
Total (P)	421	mg/kg	E
Ammonia (NH4-N)	2.5	mg/kg	A
Nitrate (NO3-N)	1.7	mg/kg	A
Organic (Org-N)	7141	mg/kg	Calc.
Volatile Matter	27.3	percent dw	D

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

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

Analyst: Nik Zumberge