

Control Laboratories

42 Hangar Way
 Watsonville, CA 95076
 www.biocharlab.com
 Tel: 831 724-5422
 Fax: 831 724-3188

Work Order Number:

2090441

Batch

Bio. Aug - Sept 2012 M

CODE:

BioChar IBI

Dusty Moller
 University of Nevada
 7828 Desert Bell Ave
 Las Vegas, NV 89128

Date Received: 09/17/12
 Sample Id.: Utah Juniper Biochar
 Sample id. Number 2090441

International BioChar Initiative (IBI) Level I

	Wet	Dry			
Moisture	22.9	0.0	percent	Declaration	ASTM D1762-84 (105c)
Total Ash	15.4	19.9	percent	50% Max	ASTM D 1762-84 (750c)
Organic Carbon	52.2	67.6	percent	Declaration	CHN by dry combustion
Inorganic Carbon	0.23	0.30	percent	Declaration	HCl treated
Hydrogen/Carbon (H:C)	0.53	0.53	molar ratio	0.7 Max	
Hydrogen	2.30	3.0	percent	Declaration	CHN by dry combustion
Total Nitrogen	0.53	0.69	percent	Declaration	CHN by dry combustion
Total Oxygen	6.5	8.4	percent	Declaration	by difference
pH value	8.77	NA	units	Declaration	Ahmedna et al (2002) (1997)
Liming (neut. value)	3.0	3.9	% CaCO3	Declaration	Rayment & Higginson
Liming (carbonate value)	1.9	2.5	% CaCO3	Declaration	ASTM D 4373
Calcium (Ca)	0.93	0.93	percent	Declaration	
Magnesium (Mg)	0.047	0.047	percent	Declaration	
Activity (Butane)*	3.1	4.0	g/100 g	Declaration	ASTM D 5742 (butane)
Bulk Density	21.18	16.34	lb/cu ft	Declaration	
Sulfur (S) Less Than:	0.01	0.01	percent	Declaration	
**Energy (HHV)		11115	(Btu/lb)		

Particle Size Distribution ASTM D2862 granular

MM	Inch	% Retained	Fraction %
> 19	0.750	0.0	0.0
16 to 19	0.6250	0.0	0.0
9.5 to 16	0.3750	6.9	6.9
6.3 to 9.5	0.2500	18.8	11.9
4.0 to 6.3	0.1575	30.5	11.7
2.0 to 4.0	0.0787	51.2	20.7
1.0 to 2.0	0.0394	71.3	20.1
0.425 to 1.0	0.0167	84.6	13.3
< 0.425	0.0167	100	15.4

*Modified from IBI protocol.
 BTU/lb = 2.32 kJ/kg

** Energy calculated from H, C, O, S, N, and Ash values
 Analyst: Frank Shields & Megan Nutt

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International BioChar Initiative (IBI) Level II

		Results		Maximum	Units	Method
		Wet Basis	Dry Basis	Allowed		
Arsenic	(As)	0.22	0.29	13	mg/kg	B
Cadmium	(Cd)	0.044	0.057	1.4	mg/kg	A
Chromium	(Cr)	10	13	93	mg/kg	A
Cobalt	(Co)	0.21	0.27	34	mg/kg	B
Copper	(Cu)	1.7	2.2	143	mg/kg	A
Lead	(Pb)	0.89	1.2	121	mg/kg	A
Molybdenum	(Mo)	Less Than: 0.01	0.01	5.0	mg/kg	B
Mercury	(Hg)	Less Than: 0.01	0.01	1.0	mg/kg	A
Nickel	(Ni)	3.6	4.7	47	mg/kg	A
Selenium	(Se)	0.028	0.036	2.0	mg/kg	B
Zinc	(Zn)	10	12	416	mg/kg	A
Boron	(B)	84	109	Declaration	mg/kg	TMECC
Chlorine	(Cl)	435	564	Declaration	mg/kg	TMECC
Sodium	(Na)	94	121	Declaration	mg/kg	TMECC

Basic Soil Enhancement Properties

Potassium	(K)	Total and available	0.26	0.33	Declaration	percent	E
Phosphorus	(P)	Total	0.032	0.041	Declaration	percent	E
Ammonia	(NH4-N)	Mineral	2.6	3	Declaration	mg/kg	R
Nitrate	(NO3-N)	Mineral	6.0	7.7	Declaration	mg/kg	R
Phosphorus	(P)	Available	9.3	12	Declaration	mg/kg	F
Electrical Conductivity		EC 1:5 w/w	1.164	NA	Declaration	S/m	R
Moisture			22.9	0.0	Declaration	percent	TMECC
pH value			8.77	NA	Declaration	units	TMECC

Methods				Method E	Enders and Lehmann (2011)
Method A	Amlinger, Farino and Pollack (2004)			Method R	Rayment and Higginson (1992)
Method B	Bureau de normalisation du Quebec (2005)			Method F	Formic Acid procedure
TMECC	Test Methods for the Examination of Compost and Composting (2001)				

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