

# Control Laboratories

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CODE:  
BioChar IBI

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Date Received: 7/6/2022  
Sample ID: Lot 1542 Pistachio Shell Biochar whole 500g  
Lab ID. Number: 2070084-01

## International BioChar Initiative (IBI) Laboratory Tests for Certification Program

|                                    | Dry Basis Unless Stated: Range | Units               | Method                    |
|------------------------------------|--------------------------------|---------------------|---------------------------|
| Moisture (time of analysis)        | 8.1                            | % wet wt.           | ASTM D1762-84 (105c)      |
| Bulk Density                       | 13.2                           | lb/cu ft            |                           |
| Organic Carbon                     | 84.9                           | % of total dry mass | Dry Combust-ASTM D 4373   |
| Hydrogen/Carbon (H:C)              | 0.37 0.7 Max                   | Molar Ratio         | H dry combustion/C(above) |
| Total Ash                          | 3.4                            | % of total dry mass | ASTM D-1762-84            |
| Total Nitrogen                     | 0.78                           | % of total dry mass | Dry Combustion            |
| pH value                           | 8.82                           | units               | 4.11USCC:dil. Rajkovich   |
| Electrical Conductivity (EC20 w/w) | 0.120                          | dS/m                | 4.10USCC:dil. Rajkovich   |
| Liming (neut. Value as-CaCO3)      | 6.4                            | %CaCO3              | AOAC 955.01               |
| Carbonates (as-CaCO3)              | 0.0                            | %CaCO3              | ASTM D 4373               |
| Butane Act.                        | 3.0                            | g/100g dry          | ASTM D 5742-95            |
| Surface Area Correlation           | 227                            | m2/g dry            | G                         |

| All units mg/kg dry unless stated: |         |                      |                       |          | Particle Size Distribution        |         |            |        |
|------------------------------------|---------|----------------------|-----------------------|----------|-----------------------------------|---------|------------|--------|
|                                    | Results | Range of Max. Levels | Reporting Limit (ppm) | Method   |                                   | Results | Units      | Method |
| Arsenic (As)                       | ND      | 13 to 100            | 0.39                  | J        | < 0.5mm                           | 0.2     | percent    | F      |
| Cadmium (Cd)                       | ND      | 1.4 to 39            | 0.16                  | J        | 0.5-1mm                           | 0.1     | percent    | F      |
| Chromium (Cr)                      | 0.61    | 93 to 1200           | 0.39                  | J        | 1-2mm                             | 2.7     | percent    | F      |
| Cobalt (Co)                        | ND      | 34 to 100            | 0.39                  | J        | 2-4mm                             | 26.5    | percent    | F      |
| Copper (Cu)                        | 3.7     | 143 to 6000          | 0.39                  | J        | 4-8mm                             | 59.7    | percent    | F      |
| Lead (Pb)                          | 0.16    | 121 to 300           | 0.16                  | J        | 8-16mm                            | 10.7    | percent    | F      |
| Molybdenum (Mo)                    | ND      | 5 to 75              | 0.39                  | J        | 16-25mm                           | 0.0     | percent    | F      |
| Mercury (Hg)                       | ND      | 1 to 17              | 0.001                 | EPA 7471 | 25-50mm                           | 0.0     | percent    | F      |
| Nickel (Ni)                        | 0.63    | 47 to 420            | 0.39                  | J        | >50mm                             | 0.0     | percent    | F      |
| Selenium (Se)                      | ND      | 2 to 200             | 0.78                  | J        | Basic Soil Enhancement Properties |         |            |        |
| Zinc (Zn)                          | 10.6    | 416 to 7400          | 0.78                  | J        | Total (K)                         | 8340    | mg/kg      | E      |
| Boron (B)                          | 8.7     | Declaration          | 3.9                   | TMECC    | Total (P)                         | 1716    | mg/kg      | E      |
| Chlorine (Cl)                      | 24.8    | Declaration          | 20.0                  | TMECC    | Ammonia (NH4-N)                   | 3.8     | mg/kg      | A      |
| Sodium (Na)                        | ND      | Declaration          | 389                   | E        | Nitrate (NO3-N)                   | 1.0     | mg/kg      | A      |
| Iron (Fe)                          | 236     | Declaration          | 19.5                  | E        | Organic (Org-N)                   | 7805    | mg/kg      | Calc.  |
| Manganese (Mn)                     | 12.1    | Declaration          | 0.39                  | J        | Volatile Matter                   | 17.3    | percent dw | D      |
| Aluminum (Al)                      | 151     | Declaration          | 27.5                  | E        |                                   |         |            |        |

\* "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

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