PHOENIX BIOCHAR

Results from Comprehensive Third-Party Testing

METALS

We commissioned third-party testing for our biochar. The table below outlines the removal capacities for various metals, including several that are highly toxic. Thanks to its cation exchange capacity, the biochar demonstrates outstanding removal results.

Notably, once toxic substances are adsorbed and bonded to the biochar, they become encapsulated and cannot escape on their own. Even plant roots are unable to uptake the bound toxins.

Metals and Other Materials Removed from "Dirty Water Solutions" Using Biochar

Independent Test Results

Metals		Starting mg/L	% Removed
Aluminum	Al	638	100%
Arsenic	As	203	100%
Barium	Ba	0.17	66%
Beryllium	Be	0.16	99%
Cadmium	Cd	0.015	100%
Chromium	Cr	166	100%
Cobalt	Co	219	100%
Copper	Cu	1	99.7%
Iron	Fe	66	99.6%
Lead	Pb	45	100%
Lithium	Li	0.17	39%
Magnesium	Mg	3	69.2%
Molybdenum	Mo	96	100%
Nickel	Ni	211	100%
Selenium	Se	215	100%
Tin	Sn	0.17	100%
Vanadium	V	0.15	75%
Zinc	Zn	75	99.7%

Table 1 - metal removal from water by using Biochar

PHOENIX BIOCHAR

NUTRIENTS

Nutrients are a key adsorptive category for Phoenix Biochar's products. In different contexts, nutrient data can be essential for improving nutrient availability for plant growth or for removing nutrients from field runoff and waterways. In both cases, Phoenix Biochar performs exceptionally well. Furthermore, our porous bags filled with nutrient-rich Phoenix Biochar can be repurposed in gardens and agricultural fields to enhance plant growth.

Ag Nutrients Removed from "Dirty Water Solutions" Using Biochar *Independent Test Results*			
Nutrients		**Starting mg/L**	**% Absorbed**
Phosphorus	non-soluble P	27	99.9%
Phosphorus	P	27	99.8%
Phosphate	PO4-P	284	86.6%
Ammonia	N	1.1	89.7%
Nitrate	NO3-N	52	64.3%

Table 2 - nutrient removal from water by using Biochar

PHOENIX BIOCHAR

SOLIDS

When Phoenix Biochar is placed in porous bags and submerged in nutrient-polluted lakes, ponds, or rivers, natural currents guide the water through the bags and biochar. The jagged exterior of the biochar effectively filters out solids. This physical removal process is particularly effective at eliminating algae blooms (turbidity) and clay (solids).

Moreover, once toxic substances are attracted and bonded to the walls of the biochar, they become encapsulated, preventing them from leaching out. Even plant roots do not absorb these bound toxins.

Solids Removed from "Dirty Water Solutions" Using Biochar *Independent Test Results*			
Solids		**Starting mg/L**	**% Removed**
Turbidity	NTU*	68 NTU	99.9%
Phosphorus	Non-soluble P	27	99.9%
Solids	SS	506	80.2%

Table 3 - solids physically removed from water by using Biochar

Figure 3 – Biochar Magnified 120x

PHOENIX BIOCHAR

WATER SEQUESTRATION

The ability to retain water is a crucial property of Phoenix Biochar, particularly in the face of drought conditions intensified by climate change. Phoenix Biochar is capable of holding 5.6 times its weight in water, ensuring that the water remains readily available to plant roots. Thanks to its structure, with long, narrow pores and very small openings, evaporation is minimal.

Water holding capacity = 5.6 x the weight of biochar