Biochar Soil Amendment

Technical data and practical application guide
SKU: **SOL-AMND-BIOCHR** | Homeowners, landscapers and project teams





Actual product photographs: bulk material and hand-scale view.

89.45%
Organic carbon, dry basis
2026 laboratory sample

98.4%
Particles below 4 mm
2025 laboratory sample

9.12
Biochar pH, 1:20 test
2025 laboratory sample

A finely graded, carbon-rich amendment for incorporation into suitable soil, compost blends and growing media. Start with the site's soil conditions, then choose the preparation method, mixing depth and application rate.

Inside this guide

Pages	What you will find
2-3	Carbon, moisture, pH, nutrients and laboratory methods
4-5	Particle grading, cumulative curve and trace-element results
6-8	Potential benefits, site selection, preparation and incorporation
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Read the measurements in context. Dataset A characterizes a sample received in May 2025. Dataset B describes a different sample collected in April 2026 and reported in May 2026. Each value is labeled with its sample and measurement basis.

Carbon and moisture

Dataset B | Sampled 2 April 2026; received 14 April 2026; report dated 9 May 2026.

Elemental and moisture results

Parameter	As received (%)	Dry basis (%)
Total moisture	40.66	-
Ash	2.27	3.83
Total carbon	53.19	89.64
Hydrogen	0.36	0.61
Nitrogen	0.26	0.43
Oxygen	3.25	5.48
Sulfur	0.01	0.01

Additional characterization

Parameter	Reported result	Basis / units
Organic carbon (Corg)	89.45	%, dry
Inorganic carbon (Cinorg)	0.19	%, dry
Calcium carbonate equivalency	1.57	%, dry
Hydrogen : organic carbon	0.08	Molar ratio
Oxygen : organic carbon	0.05	Molar ratio

Why 89.64% and 53.19% are both correct: dry-basis carbon describes the dried solids; as-received carbon includes the sample's water in the total weight. In a hypothetical 100 lb portion at this sample's moisture level, about 40.66 lb is water and 59.34 lb is dry solids. Those solids contain about 53.19 lb of total carbon.

Total versus organic carbon: total carbon includes both organic and inorganic carbon. The organic-carbon result is 89.45% on a dry basis; it should not be labeled as 89.45% of the wet, delivered material.

Reported methods: ISO 18134-1 (moisture), ISO 18122 (ash), ISO 16948 (listed elemental results) and ISO 16994 (sulfur). Additional carbon fractions and ratios are identified as CHNS method results in the source. Values above are transcribed, not averaged with Dataset A.

Soil chemistry and nutrients

Dataset A | Characterization of the sample received 7 May 2025. Units and labels follow the source.

Property	Result	Measurement context
Moisture, as received	75.4%	Wet-weight moisture
Bulk density	5.7 lb/cu ft	Explicitly reported as dry
Organic carbon	89.4%	Percent as stated in report
H:Corg	0.21	Molar ratio
pH	9.12	1:20 dilution
Electrical conductivity (EC)	1.20 dS/m	1:20 dilution
Liming, as CaCO3	6.0%	AOAC 955.01
Carbonates, as CaCO3	3.8%	ASTM D 4373
Butane activity	7.9 g/100 g dry	Adsorption characterization
Surface-area correlation	383 m2/g	Correlated estimate; not a direct BET result

Nutrients listed in the same characterization

Element	Result	Units
Nitrogen (N)	0.71	%
Phosphorus (P)	0.10	%
Potassium (K)	0.73	%
Calcium (Ca)	6,012	mg/kg
Magnesium (Mg)	1,344	mg/kg
Sulfur (S)	ND	mg/kg; MRL not shown in this table

Additional 2025 elemental values: the source's proximate panel lists total carbon 89.8%, hydrogen 1.6%, nitrogen 0.7%, sulfur 0.0%, oxygen 3.0% (calculated), and ash 4.9%.

Reading the basis: the 2025 sheet explicitly labels moisture as wet-weight and density as dry. Several other percentages are not explicitly labeled by basis on that sheet; verify the basis with the laboratory before making precise cross-report calculations. Its proximate table rounds N to 0.7%; the nutrient table above reports 0.71%.

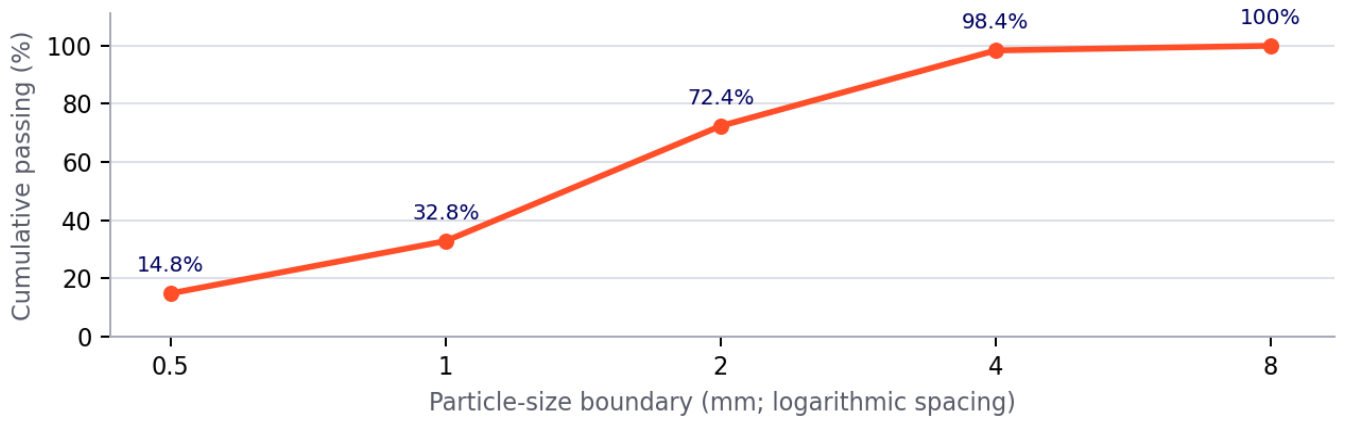
pH and liming: pH 9.12 describes the biochar test suspension, not the eventual soil blend. The 2025 liming result and the 2026 carbonate-equivalency result use different reported methods and samples; do not average them or use either alone to prescribe lime replacement.

Particle grading

Dataset A | Laboratory size bands, with cumulative passing calculated from the reported percentages.

Particle-size band	Reported fraction (%)	Cumulative below upper boundary (%)
Below 0.5 mm	14.8	14.8
0.5-1 mm	18.0	32.8
1-2 mm	39.6	72.4
2-4 mm	26.0	98.4
4-8 mm	1.6	100.0
8-16 mm	0.0	100.0
16-25 mm	0.0	100.0
25-50 mm	0.0	100.0
Above 50 mm	0.0	-

Cumulative particle-size curve



Key observations: 65.6% falls in the 1-4 mm bands, and 98.4% falls below 4 mm. The fractions total 100.0%. The curve connects the measured band boundaries as a visual guide; intermediate sizes were not separately reported.

Practical use: the small particles can be distributed through a blend, but fine material needs containment and dust control during handling. This grading is a biochar characterization, not a gravel size designation. Source method: ASTM D 2862 Granular. [A, 6, 7]

Trace-element results

Dataset A | All concentrations and reporting limits below are in mg/kg. Method letters follow the source.

Element	Result	MRL	Method
Arsenic (As)	ND	0.89	H
Cadmium (Cd)	ND	0.35	H
Chromium (Cr)	94.4	0.89	H
Cobalt (Co)	2.5	0.89	H
Lead (Pb)	0.84	0.35	H
Mercury (Hg)	ND	0.044	K
Molybdenum (Mo)	0.90	0.89	H
Nickel (Ni)	46.8	0.89	H
Selenium (Se)	ND	1.77	H
Zinc (Zn)	21.0	1.77	H
Sodium (Na)	ND	887	E
Chlorine (Cl)	606	20	D
Aluminum (Al)	758	88.7	H
Copper (Cu)	15.2	0.89	H
Iron (Fe)	1,186	44.4	E
Manganese (Mn)	214	0.89	H
Boron (B)	17.9	8.9	H

ND = below the method reporting limit, not zero. For example, the sodium result is ND at an MRL of 887 mg/kg. It does not establish that sodium is absent. Detected concentrations likewise need to be evaluated against the requirements of the intended use, rather than judged by detection alone.

Methods: H = EPA 3050B / EPA 6020; E = EPA 3050B / EPA 6010; K = EPA 7471; D = 1:20 dilution with ion chromatography. Zinc appears in more than one section of the source and is listed once here.

Use the applicable analytical methods and acceptance limits for a project's review. The 2026 elemental report does not repeat this trace-element panel; no newer trace-element values are inferred from it.

What biochar may do in soil

Match a potential benefit to the soil problem you are trying to solve, then check the actual blend's response.

Biochar is produced by heating biomass with limited oxygen. The resulting carbon-rich particles can have internal pores and reactive surfaces. Feedstock and processing conditions influence how a particular biochar interacts with soil. [2, 4]

Potential role	Why it may matter	What these reports establish
Water retention	Some biochars help certain soils retain water, particularly where texture and pore structure are limiting.	No direct water-holding-capacity test or irrigation-savings trial is included.
Nutrient retention	Surface interactions can retain some nutrient ions; the effect depends on the biochar, soil and fertility program.	Total nutrient concentrations are reported. Plant-available nutrients and cation exchange capacity are not.
Soil biology	Pores and surfaces can provide habitat; biological response depends on the surrounding soil environment.	No microbial population, inoculation or pathogen assay is included.
Persistent soil carbon	Pyrolyzed carbon can persist longer than readily decomposed organic inputs.	Carbon fractions and H:Corg ratios are reported. Field lifetime and lifecycle carbon removal are not directly measured.

Research reports positive, neutral and negative plant responses across different conditions. Treat improved growth, lower fertilizer demand and reduced watering as outcomes to evaluate, not automatic results. [1, 3, 5]

Understand what the laboratory numbers mean

pH is not buffering capacity. The pH value measures the test suspension's acidity or alkalinity. It does not show how strongly a proposed soil blend will resist pH change. Evaluate the actual blend and its soil-test recommendations.

Surface-area correlation is not a water test. The reported 383 m2/g is a correlated estimate tied to the stated adsorption method. It is not a direct BET surface-area result, water-retention measurement or guaranteed fertilizer-retention value.

Choose an application for your site

Start with the existing soil and planting requirements. Biochar is an ingredient in a soil-management plan.

Site / growing situation	What to evaluate	Practical next step
Sandy or low-retention soil	Water retention, nutrients, irrigation and the selected biochar's wetting behavior.	Trial a specified blend and compare moisture behavior with untreated soil.
Compacted or heavy soil	Compaction cause, drainage restrictions, rooting conditions and practical mixing access.	Address the physical restriction; evaluate amendments in the complete soil plan.
Already alkaline soil	Existing pH and the blend's likely effect; Dataset A tested at pH 9.12.	Check the proposed mix before broad application.
Acid-loving plants	Target root-zone pH and plant sensitivity.	Obtain a plant-specific recommendation before adding alkaline material.
Raised beds / containers	Final pH, EC, drainage, available nutrients and amendment proportions.	Test the complete growing mix and trial a limited quantity.
Established trees / turf	Root protection, disturbance limits, equipment and a suitable incorporation approach.	Use an arborist- or turf-professional-directed method where appropriate.

Useful baseline information

Record the area, proposed mixing depth, soil texture, soil pH, soluble salts or EC, organic matter and relevant fertility results. Tell the soil laboratory which plants will be grown and which amendments are being considered. [1, 5]

For a new growing mix, test the final combined recipe rather than judging its suitability from the biochar's standalone pH or nutrient figures.

Plan a comparison area

Keep an untreated comparison with similar soil, planting and management. Record the biochar dose, other amendments, irrigation and observations. This helps distinguish the biochar's response from changes caused by compost, fertilizer or watering.

Preparation and incorporation

Use the current product instructions and a site-specific blending plan. [1, 3, 6, 8]

1. Establish the target

Review soil and product data. Specify the application rate, the basis of that rate (volume or dry weight), the mixing depth and the final growing-medium requirements.

2. Confirm the supplied condition

Determine whether the material is raw, nutrient-charged or already blended. A black appearance or moisture content does not establish charging or biological inoculation.

3. Control dust before moving material

Dampen dry material as directed and work in calm conditions. Use a controlled mixing area, limit drop heights and prevent particles from reaching drains or neighboring property.

4. Precondition when the product plan calls for it

Raw biochar may be combined with suitable compost or another approved nutrient source before application. Select the recipe, moisture and conditioning time from product guidance; there is no universal charging period.

5. Blend uniformly into the intended soil volume

Distribute the specified dose through the planned depth. Avoid concentrated pockets of amendment. Protect existing roots, utilities and irrigation equipment; use an appropriate method around established plants.

6. Water and evaluate the completed blend

Settle and wet the growing medium as appropriate, then monitor soil moisture and plant response. Adjust irrigation and nutrition using observations and tests rather than assumed savings.

Charging, wetting and inoculation are different

Wetting adds moisture and assists handling. **Charging** conditions biochar with a nutrient-bearing material or solution. **Inoculation** introduces organisms. Completing one of these steps does not prove that the other two have occurred.

> **Include the whole recipe.** Compost and fertilizers contribute their own nutrients, salts, pH effects and volume. Count them in the final blend, and keep any supplemental fertility program consistent with soil-test recommendations.

Quantity and blending calculations

Work out quantities after an appropriate application rate has been specified. Use one consistent unit system.

For a planned final blended volume

Final soil-blend volume (cu yd) = area (sq ft) x mixing depth (in.) / 324
Biochar volume = final blend volume x specified biochar fraction
Other ingredients together occupy the remaining fraction of the final blend.

Example final fraction	Biochar per 1 cu yd final mix	U.S. liquid gallons
1% by volume	0.01 cu yd = 0.27 cu ft	2.02
2% by volume	0.02 cu yd = 0.54 cu ft	4.04
5% by volume	0.05 cu yd = 1.35 cu ft	10.10

The percentages above illustrate arithmetic only. They are not application-rate recommendations. Volumes are nominal before settling; measure ingredients consistently.

Worked bed example

A 200 sq ft bed with a planned 6 in. mixing depth contains **200 x 6 / 324 = 3.704 cu yd** of final blended volume. If a project professional specifies 2% biochar by final volume, the biochar portion is **0.0741 cu yd = 2.00 cu ft = 14.96 U.S. gallons**. The remaining 98% includes all other ingredients.

When adding to an existing volume

If the existing soil volume will remain in place and biochar is added to it, the denominator grows. Use:
Biochar added = existing volume x f / (1 - f)
Here f is the desired fraction of the final blend. For 2.00 cu yd of existing soil at a specified final 5%, add **2.00 x 0.05 / 0.95 = 0.1053 cu yd** of biochar, assuming additive volumes.

Account for premixes and moisture

If a premix is 50% biochar by volume, supplying 2 cu ft of biochar requires 4 cu ft of that premix; the other 2 cu ft must be included in the recipe. This is a calculation example, not a charging recipe.

The 2025 density is **5.7 lb/cu ft, dry**. Moisture differed between the sampled materials, so it is not a fixed wet delivery weight. Confirm the current order unit, moisture basis and density before converting volume to tons.

Conversions: 1 cu yd = 27 cu ft; 1 cu ft = 7.4805 U.S. liquid gallons; 1 U.S. short ton = 2,000 lb. Bucket measurements require the bucket's actual filled volume.

Handling, delivery and follow-up

Plan to contain the material during unloading, mixing and incorporation.

On-site handling

Keep dust generation low: follow product instructions for moistening, work in mild wind, limit unnecessary agitation and use controlled transfers. Wear gloves and eye protection; use appropriate particulate respiratory protection where dust cannot be controlled, following the safety data sheet and site safety plan. [6, 7]

Keep material out of storm drains and watercourses. Choose an unloading and blending area that can be contained and cleaned. Store according to the current safety data sheet, with protection from wind and runoff and separation from ignition sources. Biochar dust and fresh char can present fire hazards; do not assume that a damp appearance establishes a storage or fire classification. [7]

Information to provide when ordering

Provide	Why it helps
SKU and material	Request Biochar Soil Amendment, SOL-AMND-BIOCHR.
Quantity and unit	State the specified volume or dry-mass requirement and confirm the sales unit.
Planned use	Describe the soil blend, planting type and any required documentation.
Delivery access	Provide address, unloading location, truck access and overhead-clearance details.
Preparation needs	Confirm material condition, mixing equipment, containment and the incorporation schedule.

Monitor the actual result

Record baseline soil tests and the application date. Track plant growth, signs of stress, irrigation and changes in soil moisture. Use follow-up tests of the mixed root zone when needed, with a consistent sampling method. Compare with the untreated area before attributing changes to biochar.

A soil-management program may still require fertilizer, compost, drainage improvements or other work. Change one factor at a time where practical, and avoid automatically repeating the original biochar dose each season.

> **Bay Area delivery:** Marin, Contra Costa, Alameda, Sonoma, San Mateo and Solano counties. Prepare a firm, level unloading area and discuss steep grades, narrow entrances, low overhead obstructions or other access restrictions before scheduling.

Understanding the terms

A separate plain-language reference sheet for readers who are new to soil amendments and laboratory reports.

Term	Plain-language meaning
Biochar / pyrolysis	Biochar is carbon-rich char used as an amendment. Pyrolysis is the limited-oxygen heating process that produces it.
Feedstock	The original material used to make the biochar; feedstock affects the resulting properties.
Total carbon / organic carbon	Total carbon includes organic and inorganic fractions. Organic carbon excludes inorganic carbon such as carbonate carbon.
Dry basis	A result expressed relative to material after water is removed; use it for comparisons on a dry-solids basis.
As received	A result expressed for the sample in its received condition, including its existing moisture.
Moisture, wet-weight basis	The percentage of the received sample's total weight that is water.
pH	A measure of acidity or alkalinity. A biochar suspension's pH is not the final soil blend's pH.
Electrical conductivity / EC	An indicator of soluble ions in the specified extract; extraction methods affect comparisons.
Calcium carbonate equivalency	A measure or estimate of neutralizing potential relative to calcium carbonate, using the stated method.
Ash	Mineral residue left by the laboratory's specified heating test.
Bulk density	Mass per bulk volume, including spaces between particles. Dry and wet densities differ.
Particle-size distribution	The percentages of material in defined size bands.
Cumulative passing	The combined percentage smaller than a stated upper size boundary.
ND / MRL	ND means not detected above the method reporting limit (MRL); it does not mean zero.
mg/kg	Milligrams per kilogram; a mass concentration numerically equal to parts per million.
Total nutrient content	The measured amount of an element, not necessarily the amount immediately available to plants.
Charging	Preconditioning biochar with a nutrient-bearing material or solution before the planned use.
Inoculation	Introducing organisms. This is different from simply wetting or nutrient charging.
Surface-area correlation	An estimate derived from another measurement; it is not automatically a direct surface-area test.
H:Corg / O:Corg	Molar ratios of hydrogen or oxygen to organic carbon, used in biochar characterization.
Volume fraction	An ingredient's share of the final blended volume; it is not the same as a weight percentage.

Sources for terminology and context: laboratory datasets A and B, plus general references [1-8].

Sources, ordering and final notes

Reference edition: 25 October 2026 | SKU: SOL-AMND-BIOCHR | Document TB-BIOCHR-PUB-01

Laboratory evidence

[A] Supplier-provided characterization: sample received 7 May 2025; includes physical properties, grading, nutrients and trace elements.
[B] Supplier-provided elemental analysis: sampled 2 April 2026; report dated 9 May 2026. Original source records are retained privately; public values are summarized without supplier identifiers.

General technical references

[1] Texas A&M AgriLife Extension. Biochar for Soil Improvement: Everything You Need to Know and More.

[2] Utah State University Extension. What Is Biochar and How Is It Used?.

[3] Utah State University Extension. Biochar in Vegetable Production.

[4] Colorado State University Extension. Biochar in Colorado.

[5] University of Florida IFAS Extension. An Introduction to Biochars and Their Uses in Agriculture.

[6] University of Hawaii CTAHR. The Basics of Biochar: A Natural Soil Amendment, SCM-30.

[7] International Biochar Initiative. Guidelines on Practical Aspects of Biochar Application to Field Soil (2010).

[8] Oklahoma State University Extension. Preparation of Biochar for Use as a Soil Amendment.

[9] USDA Forest Service. Biochar Basics: An A-to-Z Guide to Biochar Production, Use, and Benefits (2022).

General references explain mechanisms and application considerations; they are not tests of this delivered product. Research outcomes from another biochar or site are not transferred as measured performance here. Reference [9] provides further background.

Order or request product information
Biochar Soil Amendment | SKU: SOL-AMND-BIOCHR
TerraBayMaterials.com | **925-393-0248** | **415-507-3721**

Disclaimer

This guide is for general product information and planning. Laboratory values apply to the samples tested and are not guaranteed specifications or certificates for every delivery. Natural and manufactured material properties, grading, moisture, density and appearance can vary. This supplier-neutral summary does not replace the original laboratory records, current product instructions or safety data sheet.

The buyer and project team are responsible for confirming material identity, current condition, required documentation, suitability, application rate, preparation and acceptance for the intended use. Follow soil-test recommendations, plant requirements and appropriate professional advice. Example calculations illustrate quantities only. Soil response, plant growth, water savings, nutrient retention, carbon permanence and other outcomes are not guaranteed.

No organic-program approval, regulatory compliance, contaminant-free status, engineering acceptance or carbon-credit eligibility is established by this guide. Consult the applicable program or project requirements. TerraBay Materials supplies the material; this guide is not a project-specific agronomic design or a guaranteed fertilizer analysis.