

Better Soil.
Better World.



Wakefield[®]
BioChar



2023 PRODUCT GUIDE

Welcome to Wakefield!



Wakefield BioChar was started in honor of Dr. Thomas R. Marrero. He had been a professor of Chemical Engineering at the University of Missouri for 35 years. He was a hard worker, a first-generation American who grew up in New York City and made education very important in his life. His life experiences are impressive. He had traveled to every continent, including living a year in Antarctica. As a young man he was offered a tryout with the Yankees. He has walked the Great Wall in China more than once. And, did most of this with physical disabilities after suffering a stroke in the early 1970's.

As a professor, he would go the extra mile for students who were far from home. Not just academically, though. He helped them earn money. Helped them learn English. He wanted to educate, and he wanted to make everyone around him feel included. He was creating a better world.

In 2014, Dr. Marrero's twin sons became concerned that he was planning his retirement. They were concerned because they knew a retired university professor without anything to do would potentially be problematic for his kids... they needed to keep him busy. He had done some research with biochar and one day, he showed his son, Tony, how to repair some soil in his front yard to grow grass again. In a moment of inspiration, Tony began putting together a blog site where Dr. Marrero could teach about biochar. The boys and their father called it Wakefield BioChar... Wakefield sounded like the right name for a product that would bring life to the soil.

Dr. Marrero did retire in 2015 but, in the same year, was diagnosed with cancer. He passed that year and the twins made the decision to keep Wakefield going. Wakefield BioChar was founded on the principles of the importance of education, the satisfaction the comes from hard work and the dedication to making the world a better place for all of us. The company is part of his legacy and an honor for two brothers, Tom and Tony, to share with you.

Learn more at wakefieldbiochar.com.



1826 Clay Road
Valdosta, GA 31601
sales@wakefieldbiochar.com

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What is Biochar?



Biochar is a plant-based, all-natural soil conditioner made entirely from recycled wood that keeps your soil healthier year after year!

Beneficial Reuse/Upcycling. With Wakefield®, this pre-consumer wood waste is reclaimed and turned into an incredible soil conditioner. Tree scraps from paper mills would be discarded and left to decompose, releasing harmful greenhouse gases into the atmosphere.

Sustainably Processed. The wood is heated at a very high temperature (pyrolysis) in a chamber with no oxygen. Any volatile gases from the process are returned to the reaction as fuel, creating a carbon-negative process.

Certified. Wakefield carbon-rich products are sustainably manufactured and certified for organic use from responsibly managed forests that provide environmental, social and economic benefits.

Better World. For every pound of biochar used, about 2 pounds of CO₂ are removed from the atmosphere.

Source: US Geological Survey, "What Is Carbon Sequestering", 2022 US Biochar Initiative (USBI), "An Ancient Soil Conditioner", 2021



- High Porosity
- Retains Water and Nutrients
- Increases Microbial Activity
- Reduces Fertilizer Waste
- Improves Aeration
- Remediates Toxins and Heavy Metals
- Lasts for Decades
- Sequesters Carbon

After pyrolysis, at the microscopic level, porous biochar fragments look like empty chambers. These chambers are the remnants of where the plant material, when living, delivered water and nutrients. These spaces hold beneficial soil microbes and the water, proteins, oils, and other substances they produce.



The surface area of 1 tablespoon of biochar is equal to the size of a soccer field.



How to Use Biochar

Usage Instructions

For Best Results
Mix biochar into the soil and water enough to keep the soil moist for 5-7 days before planting. Your new grass, plants, and trees will enjoy healthier soil all season long.



Trees & Shrubs
For new plantings, consider the area the roots will grow and add enough biochar to make it about 10% of the soil mix in that root zone. For the next 5-7 days, water enough to keep the soil moist.



For Gardens & Raised Beds
For new plantings, mix biochar into the top 4-6 inches of your garden soil. Use 1 cubic foot bag for a 4'x8' raised garden bed. For the next 5-7 days, water enough to keep the soil moist.



Lawns (New Seed & Sod)
For new lawns, seeding and sod, mix biochar into the top 2-4 inches of soil. (About 1 cubic foot bag for every 100 square feet.) Gently rake grass seeds into the soil-biochar mix. For the next 5-7 days, water enough to keep the soil moist.



Pots & Indoor Plants
For new plantings, make biochar about 10% of your potting soil. For the next 5-7 days, water enough to keep the soil moist.

For lawn repairs or patches:
Aerate the ground first. Spread biochar over the aerated area and rake thoroughly to mix biochar into the soil. Use 1 cubic foot bag for 375 square feet. For the next 5-7 days, water enough to keep the soil moist, then water as appropriate for your area.

"Used this for my outdoor potted plants, and it's really true that a few handfuls of this every two or three weeks really works quite well. My very stressed potted blueberries were in bad shape after wintering outside. After amending the soil with fresh potting soil and this compost, the blueberries thrived within a week. I made compost tea with this a couple of times as well, and it was also great. Very nice product!"

-K.Q.

Our Products

Biochar Soil Conditioner

Organic soil conditioner for outdoor and indoor plants, gardens and lawns

"This stuff works, I put it down and within a week we had grass coming in, I watered it twice a day, I only bought a bag of this and my husband bought another brand at Lowe's to cover areas we missed and this hands down was the winner."

—H



Ingredients: 100% responsibly made from wood



- A better garden starts with better soil.** Biochar improves the health of any soil, so you can have beautiful plants and a bountiful garden...with less work!
- Healthier Soil** — Increases microbial activity and helps get the right balance of water and nutrients to roots.
- Perfect for Any Type of Plant** — Use indoor and outdoor, raised garden beds, trees, shrubs, lawn, golf course — anything that grows!
- Use Less Water** — Helps soil retain moisture and deliver water to plant roots more efficiently so you can use less water and reduce the work of watering. Great for use in areas prone to erosion and to improve drought resistance.
- Add to Your Current Routine** — If you use fertilizer or other products, biochar will help reduce washaway, so other additives work better with less.
- Reduces Greenhouse Gas Emissions** — Biochar prevents carbon dioxide, methane and other harmful gases from entering our atmosphere. Every 1 pound of biochar eliminates 2 pounds of carbon dioxide, helping to slow climate change.
- Additional Environmental Benefits** — Returns carbon to the earth to enhance soil quality for generations; Prevents metals and toxins from leaching into your garden.
- Plant-Based and Vegan**
- Odorless** — Biochar that is made correctly for your soil will not have a "campfire" smell.

Available Sizes:



For detailed lab analysis and pricing of our biochar contact sales@wakefieldbiochar.com.

Compost + Biochar with Mycorrhizal Fungi

Organic soil conditioner for outdoor and indoor plants, gardens and lawns

Master Gardener results with Lazy Gardener effort!



Ingredients: 80% Organic Compost made from wood, 20% Biochar made from wood, and Mycorrhizal Fungi

This rich blend of premium compost and biochar is ready for your garden from the moment you add it, so you do less work. Improve the health of any soil by adding this blend to your own soil—or, use this instead of soil or potting mix, and plant right in it.

- Healthier Soil** — Increases microbial activity and helps get the right balance of water and nutrients to roots to support growth and enhance seed germination, with mycorrhizal fungi to strengthen disease resistance.
- Perfect for Any Type of Plant** — Use indoor and outdoor, raised garden beds, trees, shrubs, lawn, golf course — anything that grows!
- Use Less Water** — Helps soil retain moisture and deliver water to plant roots more efficiently so you can use less water and reduce the work of watering. Great for use in areas prone to erosion and helps improve drought resistance.
- Add to Your Current Routine** — A rich blend of premium compost, biochar and mycorrhizal fungi that helps improve soil health with no adverse effects on any other additives you might already be using.
- Reduces Greenhouse Gas Emissions** — Biochar prevents carbon dioxide, methane and other harmful gases from entering our atmosphere. Every 1 pound of biochar eliminates 2 pounds of carbon dioxide, helping to slow climate change.
- Other Environmental Benefits** — Returns carbon to the earth to enhance soil quality for generations; Prevents metals and toxins from leaching into your garden.
- Plant-Based and Vegan**

Available Sizes:



"Omw!! It makes everything great! I use this as a soil additive and amendment!! Bought several times and will continue! Thank you!"

—L

Guaranteed Analysis

Soil Amending Ingredients:
Compost 80%
Wood Biochar 20%



Compost & Biochar



Wood Biochar

with Mycorrhizal Fungi

Premium Compost

Organic compost for outdoor and indoor plants, gardens and lawns

"My cucumber and pepper plants were very happy and growing large immediately after receiving some of these. It has no odor which makes my neighbors very happy."

—J



Ingredients: 100% made from wood



Our premium compost is made from untreated wood scraps. Organic compost enriches your soil to help retain water and reduce disease. That means you can sustainably grow healthier plants with less work!

Healthier Soil — Enables your soil to retain water and reduce disease to help your garden thrive.

Ready to Use — Use right out of the bag, mix with organic matter from compost bins, or make your own compost kits to enhance composting results.

Perfect for Any Type of Plant — Safe and healthy for outdoor gardens, raised garden beds, lawn soil, vegetable garden soil, flowers, trees and indoor plants.



Maintain Lawns and Gardens — Use as a top dressing for existing lawns, vegetable gardens or flower gardens.

100% Natural and Organic
No Unpleasant Odor

Available Sizes:



2 cu. yd.
Supersack



1 cu. ft.
Bag

For detailed lab analysis and pricing of our biochar contact sales@wakefieldbiochar.com.



Wakefield Product Overview

	SIZES				OMRI	FSC®	Custom Options
	Bulk	Cubic Foot	Gallon	1.5 Quart			
Biochar	●	●	●	●	●	●	Yes
Compost+Biochar	●	●	●		●	Biochar-Yes	Yes
Compost	●	●			●		No

Custom Carbon Options

Wakefield offers particle sizing, moisture levels and feedstock. Particle size ranges from powdered material to 10mm flakes. Custom carbon products are limited to bulk quantities.

For detailed lab analysis and pricing contact sales@wakefieldbiochar.com.

Enhancements for Custom Blends Include:

- Worm Castings
- Pine Bark Fines
- Microbial Solution
- Mycorrhizae Fungi
- *Plus, customer-supplied inputs may be blended pending approval.*

How to Order



Contact Wakefield to Order
sales@wakefieldbiochar.com
 (229)415-4105

Ordering in Bulk

Biochar Soil Conditioner

2 cubic yard Supersack

Our large 'super sack' is filled with 2 cubic yards of OMRI-listed Wakefield Biochar. Volume discounts are available for trailer loads. Wakefield can ship as a loose load pending hauler availability.

Compost + Biochar Blend

2 cubic yard Supersack

Super sacks are available filled with our Compost + Biochar Blend, a purely organic mix of OMRI-listed compost made from wood feedstock, mycorrhizal fungi, and Wakefield Biochar Soil Conditioner.

Biochar Application Rate

Mix biochar into your soil up to 100% in volume for general application.

For bulk application, a single acre of land can support up to 24 super sacks of biochar to reach 100% by volume for the top 4" - 6". However, with precision application along the seed row of your crop, the top required volume can be reduced to two super sacks (4 cubic yards) of biochar. For this reduced amount, apply the biochar along a 6" to 10" wide path in the seed row.

For larger applications consider the following rates as a general guideline. Contact a Wakefield representative for recommendations specific to your project.

Biochar Application Rates

5" Tillage Depth

Area or Application	% or Biochar by Volume	Cubic Yards (cu.yd.)
1,000SF	10%	1.5
	5%	.8
	2.5%	.5
1Acre	10%	67.2
	5%	33.6
	2.5%	16.8

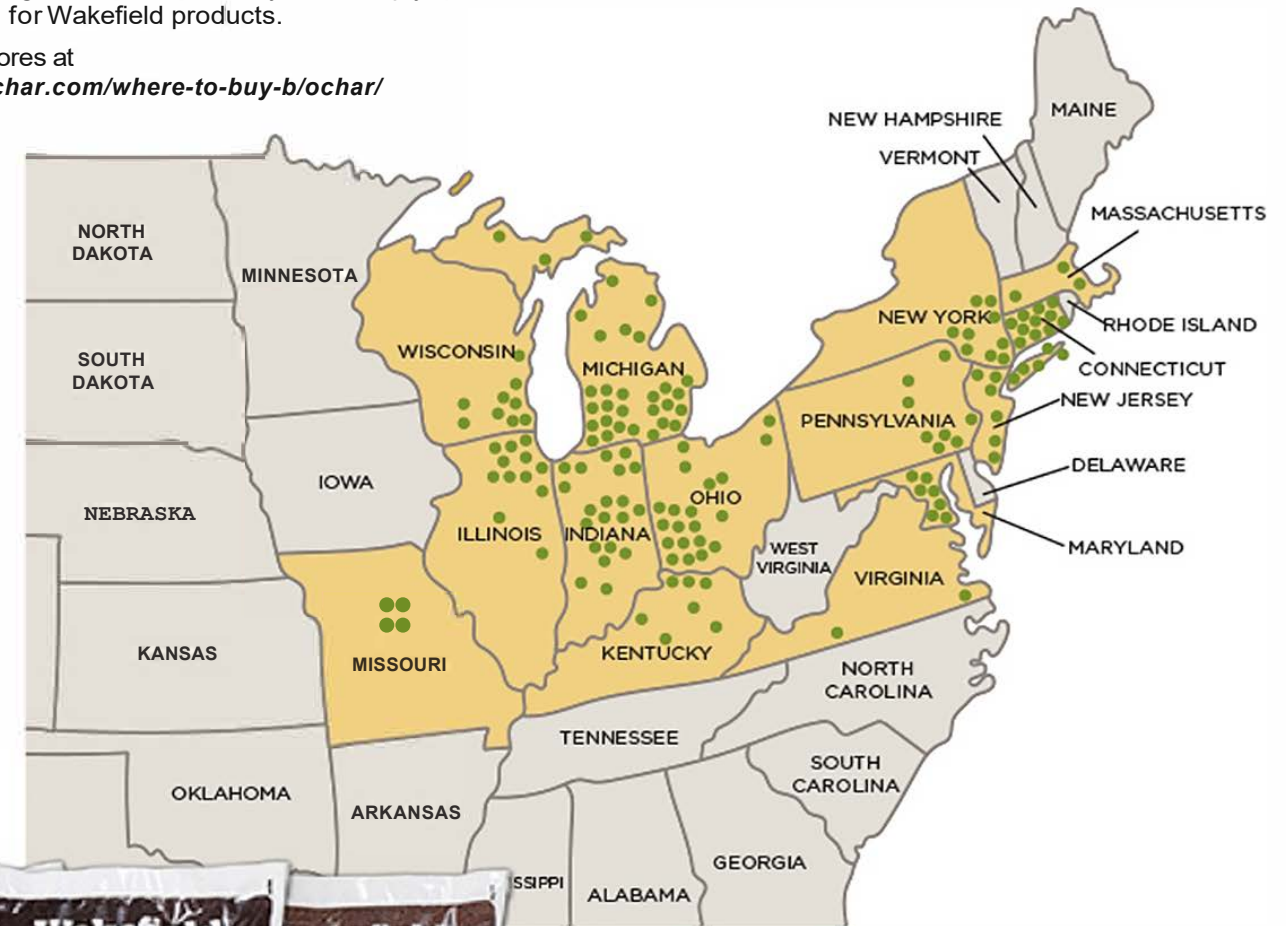
Where to Buy Wakefield Products

Find the retail lawn & garden store nearest you or shop your favorite online store for Wakefield products.

See the full list of stores at
www.wakefieldbiochar.com/where-to-buy-biochar/



and more!



Are you a distributor?
 Contact Wakefield at info@wakefieldbiochar.com for more information about our wholesale programs.

Other Uses

Soil Remediation — Biochar can also filter impure materials from moving through water runoff and into streams, lakes, and other systems that may impact the public water supply.

Odor Filtering — Biochar absorbs gases, including those released from animal manure. So, it can reduce the odor generated by swine and poultry farms. And, for those who don't live on a farm, biochar helps reduce odor from cat litter boxes.



Carbon Sequestration — The process that is specifically used to manufacture biochar for soil health is a carbon-negative system. This creates the added benefit of reducing the amount of CO₂ that otherwise might have been released into the atmosphere.

Livestock — Farmers' awareness and use of biochar as a feed supplement to improve animal health and improve nutrient intake efficiency has increased over recent years. Additionally, the biochar is inoculated with nitrogen-rich organic compounds during the digestion process and the animal manure becomes a supercharged organic fertilizer for agricultural application.

Water Filtration — Results in research with biochar and wastewater filtration showed that biochar increased micropollutant elimination to almost 100% for all substances. Other water



systems can also benefit from biochar in the removal of heavy metals and contaminants.

Concrete — Research into the use of biochar as a material in concrete shows positive traction. Biochar can be used to substitute for aggregate, especially in lightweight concrete. It was found that replacing sand with 20% biochar could enhance its strength while reducing bulk density.



Wakefield is the first company to track biochar supply data using blockchain.



Sustainability

A sustainability program for most companies means there is a system in place to reduce the waste of materials in the company's operations and that their processes do as little short-term and long-term negative impact to our environment. The acceptance and implementation of a sustainability program in corporate culture has become much easier to implement over the past few years. The increase of media attention to the topic of climate change, the back and forth of government regulation to help reduce the destruction of our environment and a general need for public involvement in reducing our carbon footprint has become a part of our culture. Just as the need to incorporate recycling of plastic bottles and aluminum cans in our homes and offices grew over the '80's and '90's we are now hearing the term 'sustainability' in a similar way.

What is beneficial reuse?

In an effort to create a healthier planet, companies can reuse byproducts or waste materials as a fuel or a raw material for another product. The Environmental Protection Agency (EPA) calls this process "beneficial reuse — turning would-be waste into a valuable commodity." The benefits of beneficial reuse include a healthier planet and a stronger economy, and increased profitability for businesses.

Wakefield BioChar is your beneficial reuse partner for biomass and other mill byproducts.

Our staff has decades of experience managing biomass waste from paper mills. We integrate into mill operations to improve the mill's profitability and



Wakefield helps large mills achieve and surpass sustainability goals while reducing their operating costs.

eliminate environmental concerns from waste material.

Wakefield offers services in three key areas of mill operations:

Inside The Gate

- Management and off-take agreements for the beneficial reuse of wood ash, lime mud and wood-fiber sludge.

Zero Landfill Program

- The use of pyrolysis/gasification to reduce and eliminate on-site environmental landfill for all biomass and plastics.

- Generation of renewable energy for direct integration into mill operations.

- Conversion of mill wastes to biochar for land applications and other revenue generating products.

Mill Land & Road Maintenance

- Industrial Landscaping including maintenance of fields and roads.

- Maintain ponds and piping in support of mill operations.

Why is beneficial reuse important?

The beneficial reuse of waste materials

has rapidly become a high priority to large manufacturers. The concept of waste disposal has evolved and mills are more and more responsible for the complete management of materials used in manufacturing. The potential for environmental contamination from biomass waste is no longer overlooked.

Wakefield offers innovative beneficial reuse methods that truly partner with large mills. The biomass waste material is re-purposed for use in other industries through our Soil Health and Advanced Materials divisions.

How is beneficial reuse incorporated into Wakefield BioChar soil health products?

Raw materials from mill waste production are repurposed and recycled for soil conditioners that Wakefield BioChar distributes through its Soil Health division. Customers from backyard gardeners to soil suppliers and farms benefit from these organic, beneficial soil inputs. This is a critical step in the circular economy. And, Wakefield is proud to do its part to help business and consumers make better soil for a better world.



Wakefield[®]
BioChar

wakefieldbiochar.com