RESEARCH LABORATORY TECHNICAL REPORT

Biochar Soil Amendment

Frequently Asked Questions

What is it made from?

How does it benefit soil?

Biochar is a term used to describe charred, organic material that is applied to soils with the intent to improve soil properties. Many sources of organic matter may be used, but can impact the properties of the biochar (Figure 1). Biochar differs from charcoal because its components are specially formulated and optimally balanced for soil. Current interest in biochar has been inspired by the historical use of charcoal to amend "terra preta" and "terra mulata" soils in the Amazon Basin. These soils were high in crop productivity in an otherwise unproductive soil type, and resulted from the use of charred biomass by the areas' inhabitants. The study of these ancient soils has demonstrated the benefits and persistence of charred matter in soils for long spans of time.

Figure 1: Biochar made from wood chips of pine trees killed by Mountain Pine Beetle



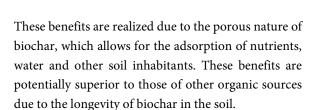
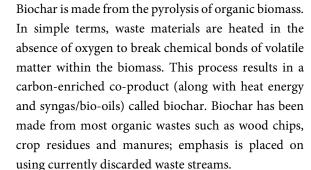


Figure 2: Biochar mixed into clay loam soil





Many benefits to soil characteristics have been demonstrated by incorporating biochar (Figure 2 and 3). Increases in water retention, microbial activity and plant yields have been documented in addition to reductions in nutrient leaching and fertilizer inputs.



By Kelby Fite, PhD

How does it benefit plants?

Studies show plant growth and fertility increase when soil quality is improved by biochar. Numbers of plantenhancing microorganisms, such as Trichoderma, are boosted in soils amended with biochar. These microorganisms play a role in eliciting a benefit known as systemic-induced resistance (SIR). SIR can result in increased defense mechanisms that allow plants to deter and combat insect and disease attacks.

Figure 3: Biochar application to native soil within the root zone of existing shade tree using a pneumatic Airspade



Are there any other benefits?

Biochar production retains carbon while producing energy and synthesis gas, harboring the potential to be carbon negative. The stability of biochar in soil promises to be a combatant against atmospheric CO₂ increases and an ally in reversing heat-trapping gases in our atmosphere.



Founded in 1926, The Bartlett Tree Research Laboratories is the research wing of Bartlett Tree Experts. Scientists here develop guidelines for all of the Company's services. The Lab also houses a stateof-the-art plant diagnostic clinic and provides vital technical support to Bartlett arborists and field staff for the benefit of our clients.