

# BIOCHAR SOIL AMENDMENT

## FREQUENTLY ASKED QUESTIONS

### What is biochar?

Biochar is charcoal that is specifically produced for application to soil to improve plant growth and health. Many sources of organic matter may be used to produce biochar, but will impact its properties. Biochar differs from charcoal used for cooking 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 were the result of the use of charred materials by the area’s inhabitants. The study of these ancient soils has demonstrated the benefits and persistence of charred matter in soils for long spans of time.



*Biochar mixed into clay loam soil*



*Biochar made from waste wood of pines killed by bark beetles*

### What is it made from?

Biochar is made from the pyrolysis (heating) of organic biomass. In simple terms, waste materials are heated in the absence of oxygen to break chemical bonds of volatile matter within the biomass. This process results in a carbon-enriched co-product (along with heat energy and syngas/bio-oils) called biochar. Biochar has been made from most organic wastes such as wood chips, crop residues and manures; emphasis is placed on using currently discarded organic waste.

### **How does it benefit soil?**

Many benefits to soil characteristics have been demonstrated by the incorporation of biochar. Increases in water retention, microbial activity and plant yields have been documented, in addition to reductions in nutrient leaching and fertilizer inputs. These benefits are realized due to the porous nature of biochar, which allows for the adsorption of nutrients, water and other soil inhabitants. These benefits are potentially superior to those of other organic sources due to the longevity of biochar in the soil.

### **How does it benefit plants?**

Studies show plant growth and fertility increase when soil quality is improved by biochar. Numbers of plant-enhancing 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 the increase in defense mechanisms within the plant that prevents damage from insect and disease pests.

### **Are there any other benefits?**

Biochar production retains carbon while producing energy and synthesis gas, harboring the potential to be carbon negative. The energy production potential and the stability of biochar in soil combine to have important implications for reducing atmospheric CO<sub>2</sub> increases, and therefore the impact of climate change.



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