

A Few Facts about Biochar

Biochar is a term applied to any organic material or “biomass” that has been burned or charred with limited oxygen, as is done when making commercial charcoal for fuel. Biochar has promise as a soil amendment and a means of stabilizing and sequestering carbon.



In locations along rivers and streams in the Amazon Basin, one can find narrow bands of black earth called “terra preta.” These sites proved to be locations where humans dwelled, where the partially-burned coals from cooking fires and other burning had accumulated over many years. Terra preta soils are exceptionally fertile and productive, with very stable organic content. Biochar refers to the charred organic materials that give terra preta soils their color and fertile character.

Biochar in soils can help increase moisture holding capacity, improve fertilizer efficiency, increase organic matter, and improve habitat for beneficial soil microbes. These benefits are among the main reasons for the growing interest in making and using biochar.

Biochar is created by a chemical process called pyrolysis, in which material is heated in the presence of limited oxygen. The biochar in terra preta resulted from open-air fires that left charred and partially burned remains. It was probably created when

deep ash restricted air flow into the fires, or when hot fires were intentionally doused with water or covered with soil. Such methods can still be used today to make and incorporate biochar. However, most modern production today is done in retorts.

There are various styles and designs of retorts for producing biochar, from small cooking stoves that produce biochar as a by-product, to large industrial models capable of producing biochar, bio-oils, and fuel gasses, as well as electricity and heat. A simple and low-cost retort suitable for gardeners and small farmers is the two-barrel nested retort of the sort tested at the Kerr Center.

Another reason for popular interest in biochar is its potential to sequester carbon. The carbon in biochar is remarkably stable and long lasting. Some advocates argue that it is one of the few good technologies available to reduce atmospheric carbon levels.

Despite its ancient origins, there is little research on biochar. Additionally, despite its touted benefits, some early studies have produced conflicting results. If prepared incorrectly, applied at improper rates, or made from contaminated feedstock, biochar can cause radical increases in soil pH, introduce toxins, and bind minerals that would otherwise be available to plants.

To help mitigate these hazards, clean feedstock should be used at the outset. When finished biochar should be composted with manure and other organic materials before applying to the soil. Composting “charges” the biochar with nutrients, water, and beneficial microbes, so that it does not compete for these with crop plants when added to the soil.

There are several sources for additional information. A good website to begin with is the International Biochar Initiative (www.biochar-international.org). In addition, a short bibliography titled *Exploring Biochar* is available on the Kerr Center website.

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