

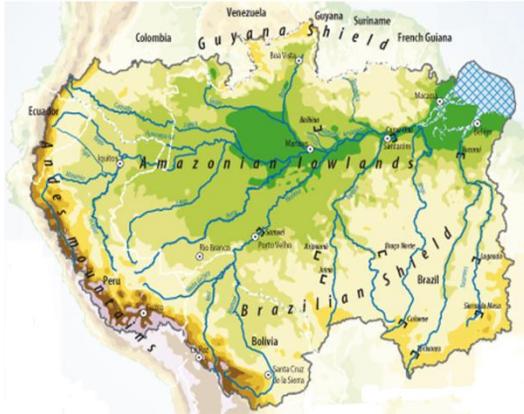
Terra Preta

Amazonian Dark Earth



Terra Preta

EPI's Carbon Char residue offers a wide variety of uses, although much of this choice is determined by the type of material to be processed and the conditions applied by the process. As a smokeless fuel it can provide high levels of energy, acting as a substitute for naturally occurring resources such as coal or gas. Although high levels of inert will have a detrimental affect to the overall calorific value of the fuel. Char created from processing plant and cellulosic material will present opportunities to convert the char into Activated Carbon, used in the air and water purification industries. But more recently, scientists around the world have become aware of its potential as a soil conditioner and fertiliser with extensive horticultural and environmental benefits. This high quality, energy rich carbon char, is the residual solid that remains after processing organic material using EPI's unique technology. There is minimal variation in the composition of the residual char resulting from various materials treated by our process, because the organic content will always be reduced to carbon. Any volatile matter (PAH's, VOCs & SVOCs) that may have been present within the original material, is completely destroyed by exposure to high temperatures during our process. Only the inert material remains unchanged .



"*Terra preta*" (which means *Dark Soil* in Portuguese) refers to vast expanses of very dark soils found in the Amazon Basin, also known as "*Amazonian Dark Earth*" or "*Indian Black Earth*". In Portuguese its full name is "*Terra preta de indio*". These soils are highly fertile and nutrient rich and it is thought that they were formed by the early Aztec and Mayan civilisations, who fertilised the land with charcoal and pottery shards, together with various plant and animal residues. It is now widely accepted that these soils are a direct result of this indigenous soil management, which dramatically improved the productivity of the soil by adding low temperature charcoal from a mix of organic wastes, wood and leafy biomass (termed Biochar).

The beneficial properties are primarily due to the high charcoal composition providing exactly the right conditions to support a unique composition of microbial life within the soil. In such conditions the microbes multiply rapidly, producing a net increase in organic matter. In simple terms the *terra preta* literally grows.

There are a number of additional benefits to be derived from the high quantities of carbon char which now forms a large proportion of the soil. The carbon locks in the microbial life and nutrients so effectively, that they are able to provide a continuous source of feed for the growing plants. Neither rain, wind nor sun are able to erode or leach away these precious nutrients.

The combination of charcoal and shards give the soil loft and structure which better aids agriculture, especially where drainage and moisture retention must be carefully balanced. Latest trials suggest that adding pure carbon char to our soil can replicate the benefits of *terra preta*, potentially increasing some crop yields by over 800%.



*Terra Preta Soil
Containing 9% Carbon*

Research shows that a hectare of metre-deep *terra preta* contains well over 150 tonnes of carbon. The extra carbon is not just in the char, it's also in the organic carbon and enhanced bacterial biomass that the char sustains. Compared with the surrounding soil, *terra preta* can retain three times as much phosphorus and nitrogen whilst containing up to 9% carbon, compared with around 0.5% for normal soils. From an environmental perspective, there are a number of additional benefits to be derived from mixing the carbon char into the soil. Naturally occurring greenhouse gas emissions from the soil can be greatly reduced. Emissions of Nitrogen Dioxide can drop five fold, whilst Carbon Dioxide emissions could be completely eradicated.

The char locks the carbon into the soil so completely that evidence suggests that the carbon can be effectively sequestered in the char matrix for hundreds, if not thousands of years, thereby removing the carbon from the atmosphere in a virtually permanent form.

