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Biochar- A Soil Amendment

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Substances introduced into the soil to manipulate physical or chemical properties are known as soil amendments. Biochar ("solids obtained from thermochemical conversion of biomass in a low oxygen environment") or black charcoal, due to its sorption properties, improves fertility associated with soil health and farm profitability. Hence it can be used as a supplement. Its properties such as high carbon content, high pH, high stability, high porosity and high surface area make it more convenient.

The Biochar works by two mechanisms. It preserves nutrients already present in the soil and other sources by storing them in a matrix, making nutrients available when plants need them, and adding other nutrients such as K & P. It affects soil performance by retaining moisture and making it available in hot, dry soil conditions with low rainfall. Ultimately, they lead to improved crop yields. According to scientific research, biochar can increase crop yields by an average of 10%. Biochar as a supplement can reduce the plant availability of potentially toxic metals. Some metals, such as Cu, Mn, and Zn, are essential phytonutrients, but their high concentrations are also toxic to plants and aquatic organisms. Biochar is superior to lime for repairing areas contaminated with phytotoxic metals, mainly because acidic conditions lead to metal leaching and can threaten groundwater. The optimum proportion of biochar depends on the type of soil and vegetation. Applying 5-20% by volume of soil biochar gives positive results.

The process by which biochar is made has a direct impact on its quality. The absorption capacity of biochar will eventually decrease, but the cation exchange capacity will increase. The Mobile matter can block porosity and initial adsorption, but is highly susceptible to biodegradation and can mitigate these effects. The physical structure of the starting material, primarily its pore size, primarily determines the surface area, water retention capacity, and biological use of the biochar produced, and is essentially shaped during "heat denaturation". The higher the proportion of micropores, the larger the surface area and the higher the ability to retain nutrients, but many soil microbes are too large to take

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advantage of such small spaces and benefit from some large pore size. From the perspective of promoting plant growth, biochars with different pore sizes may be best suited to improve the physical, chemical and biological properties of the soil.

Biochar can resist climate change because it resists degradation and retains carbon in the soil for hundreds to thousands of years. In addition, it can produce oil and gas byproducts that can be used as fuel and provide clean and renewable energy. It can combat global climate change by congesting fossil fuel consumption and isolating carbon in a stable carbon pool in the soil.