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POTENTIAL OF ENGINEERED PYROGENIC CARBON IN REVITALIZING FERTILITY OF SUB-SAHARAN AFRICAN SOILS: A REVIEW

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ABSTRACT

The soils of Sub-Saharan Africa are generally relatively of low inherent fertility status because of the nature of the soils, climatic conditions and scanty vegetation cover that facilitate intensive degradation and perennial loss of topsoil coupled with poor soil management practices. These factors lead to poor crop yields, hunger and food insecurity in the region. Being an organic based soil nutrient management systems, engineered pyrogenic carbon could be a reliable soil management strategy for Sub-Saharan African. Pyrogenic carbon may not be a silver bullet that will solve environmental problems without a much wider and far-reaching strategy. But it can provide an important tool for addressing a wide range of the major challenges bordered around soil degradation and food insecurity, climate-smart agriculture, and waste management. This review therefore, synthesizes current knowledge regarding the behavior of engineered pyrogenic carbon as a soil amendment in order to highlight its prospects for revitalizing the low fertility status of the soils of Sub-Saharan Africa. Studies show strong evidence that engineered pyrogenic carbon, especially the cost-effective biochar, retains recalcitrant carbon in the soil that could improve soil structure, increase nutrient retention and availability, prevent loss of nutrients, support crop growth and increase crop yields. It is imperative therefore, that the ability to revitalize the low fertility status of Sub-Saharan soils lies on biochar, a cost-effective engineered pyrogenic carbon that smallholder African farmers can afford.

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