TITLE:

DEVELOPMENT OF BIOCHAR FROM COCONUT SHELL: PYROLYSIS PROCESS

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ABSTRACT

Biochar is an organic substance with a high carbon content that is produced as a by-product of the pyrolysis of biomass at high temperature and low oxygen levels. The process of pyrolysis, which yields oil and gas as by products while also producing biochar, entails heating biomass (such as coconut shell) completely or almost completely in the absence of oxygen. However, the processing conditions have an impact on how much of these materials are produced. This biochar project is to determine the increases of soils ability to retain water, nutrients, and agricultural chemicals, preventing water contamination. The content of polluted water is higher than clean water nowadays due to people who like to pollute nature such as throwing waste in the water. Biochar will be burned in a constant temperature with different time rates to study the effectiveness of biochar in the water recovery process. The results I expect is that to obtain high water recovery effectiveness, biochar burned for a long time is needed.

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CHAPTER 1
BACKGROUND

1.1 Introduction

To address the issues with soil fertility, biochar has gained widespread acceptance as a suitable substitute. Biochar is a carbon-rich product obtained when organic biomass is heated under limited or without oxygen conditions [1]. Soil application of biochar may enhance soil quality and it can be an effective means of helping to mitigate global climate change through Carbon sequestration, which offers opportunities for sustainable soil management. The benefits of biochar application to soil rely on high affinity of nutrients to biochar and appear to be more stable and have been observed to remain in soil for hundreds or even thousands of years.

In addition, biochar is highly absorbent and therefore increases the soils' ability to retain water, nutrients, and agricultural chemicals, preventing water contamination. It also a limiting agent that contains most of the nutrients that were in the biomass, can release them slowly. These properties can be used effectively to address some of the environmental problems including soil degradation and water pollution from agro-chemicals and climate change. A lot of studies have shown that biochar could improve nutrient retention and cation exchange capacity, decreasing soil acidity, improved soil structure, and increase crop yield.

The kind of organic material or feedstock used, and the manufacturing circumstances have a significant impact on the relative efficacy of biochar as a soil amendment [2]. A variety of feedstocks can be used to make biochar such as crop waste, rice husk, coconut shell, and animal dung. Nutrient content of biochar made from plant sources is frequently low, especially N. Animal waste often contains more nutrients than plant waste, so biochar made from animal waste may help increase the availability of nutrients in the soil. Small farmers only face equipment and technological issues when manufacturing biochar.