

THE EFFECT OF BIOCHAR ASSESSMENT ON IMPROVING SOIL FERTILITY AND INCREASING MAIZE AND BEAN CROP PRODUCTIVITY IN ANGOLA AND LESOTHO

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Introduction

The Intensive agriculture is currently marked by the excessive use of inputs.

It causes enormous pressure on ecosystems, negatively affecting soil fertility.

Biochar resulting from the pyrolysis of biomass in agricultural soils is currently a strategy used for carbon sequestration and improvement of soil fertility.

Biochar increases crop yields.

What techniques are needed to produce biochar for use in agriculture?

Objectives

Demonstrate the techniques used to produce biochar.

To analyze the effect of biochar on improving soil fertility and increasing crop productivity.

Methods

- 1. **Biochar production technology**
- Collection/cutting of biomass and drying
- Cutting tree branches (TB) or remnants of previous crops (PC), especially nutrient-rich materials.
- Fragment the GA and RCA into small pieces and lay them dry. Colocação da biomassa na camara de aquecimento
- Pyrolysis time varies depending on the temperature used for firing.
- Pack the resulting charcoal in pyrolytic bags and Transport it to the test site.
- 2. **Analysis the effect of biochar**

Field Trial:

- Different concentrations of biochar (10, 20, 30, 40 t.ha⁻¹) with several replicates, associated
- Organic matter and/or mineral fertiliser
- Simple biochar control.
- Biochar Efficiency
- Analysis of soil properties before, during and after the test
- Analysis of the yield parameters of the crops installed.



Figure 1. Filling the chamber with biomass



Figure 2. Demonstration of the burning of plant material for biochar production



Figure 3- Incorporation of biochar into soil



Figure 4 – Biochar test in corn and bean crops



Figure 5. Measurement of maize crop yield parameters

Results

Conducted Trainings to Extensionists and Lead Farmers.

Selected beneficiaries field schools (ECA's) in the commune of Chipipa municipality of Huambo. Demonstrations on biochar production techniques were carried out.

Pyrolyzed biochar produced.



Figure 6. Farmers trained with new biochar production technology



Figure 7. Farmers to be trained at ECA

Final thoughts

The training of interested people for its execution will facilitate the dissemination of the technique.

The demonstration of the biochar production technique had positive effects and demonstrate the efficiency of the production technique.

The effects of biochar on soil fertility and crop yields will be disclosed to farmers.

References

- Onay, O., Kocker, O.M. (2003). Fast and Flash Pyrolysis of Rapeseed. Renewable Energy. Colombia
- Musafer, N., Joshi, A. D., & Michel, B. (2012). Sustainable biochar Systems in Developing Countries. Project Reference number: ARCP2012-20NSY-Musafer. Asia-Pacific:APN. Final report.