Title: Biochar fertilizer

Author: Florence Namulindwa Ddumba – Kulika Uganda. (Master Trainer)
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Summary

The biochar fertilizer provides not only nutrients to crops, but also microclimate favourable conditions for plants growth, mostly during the dry season. Materials used to make this biochar fertilizer is locally sourced from crop residues form beans, maize, ground nuts, coffee husks, residues of fodder, assorted plants rich in NPK like *Tithonia*, *Lantana camara*, Russian corn Frey plus droppings of animal residues. Materials for making plant tea should be properly dried for easy carbonation. This bio fertilizer is good for organic tomato growing during the dry season.

Description

Plant materials rich in essential plant nutrients like *Tithonia*, *Lantana camara*, Russian comfrey, *Calliandra*, *sesbania*, dry banana peelings, maize cobs, and residues of leguminous plants after harvesting are dried properly and carbonized in kiln. After carbonization the materials are dried and crushed into biochar with the following benefits;

- a bio- and natural
- fertilizer; increase
- nutrients availability to
- plants; keeping moisture
- in the soil; it harbours
- microorganisms; it

creates a favourable microclimate for plants.

1. Process of making biochar

Below are steps of making the biochar.

1.1 Making the biochar

Nutrient rich materials are collected and dried properly before being carbonized in the kiln. Such materials include plant residues like bean husks, ground nut residues, coffee husks, plants rich in NPK like *Tithonia*, *Lantana camara*, Russian comfrey, fodder shrubs which are leguminous like *Calliandra*, *Sesbania*, Lucern, *Leuceana* plus animal residues.

Figure 1. A kiln being packed with plant materials for making biochar

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After packing the plant materials in the kiln (made of metals), a hole is cut at the bottom of the kiln through which fire is introduced. When proper burning is achieved, the kiln is placed down by pulling way the stones supporting the kiln. This is done to enable proper carbonization to happen, that is to say burning without oxygen. Materials are burnt into char, not into ashes. After cooling down, materials are crushed down using a motorized crusher, manual crusher or crushed locally in bags with sticks.

1.2 Crushing the char

After carbonization, materials are crushed using a biochar crusher. Biochar crushers are two types, the manual and the motorized. The manual ranges between UGX 250 000 to UGX 500 000 then the motorized ranges between one and two million UGX. However, most women use local methods of crushing whereby materials are put in a bag and get sticks to crush by biting into powder form and then sieve to get the powder, however this method is time-consuming and tedious.

Figure 2. Crushed biochar using local methods

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Figure 3. Young women applying the biochar in planting holes

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Figure 4. Sesame planted using biochar

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2. Planting bananas using biochar

Dig a hole of 2 feet deep and 3 feet wide. Add 2 kg of biochar in the hole. Mix topsoil with the biochar thoroughly well before planting. Then plant the bananas and cover well.

Figure 5. Bananas planted using biochar

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3. Dry farming

With the help of the biochar, dry farming can be possible and farmers can earn more due to the high demand of farm product, since during the dry seasons very few farmers grow for the market because it can be too expensive in contrast to the rain fed farming. Dry farming means growing crops during the dry season which is not a common practice in Uganda because small scale farmers can't afford irrigation systems. When farming is done during dry season, biochar is used due to its various attributes which includes water retaining ability which sustains proper plant growth during dry season.

Figure 6. Cabbage planted in dry season using Bio char

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3.1 Growing Pineapples using biochar

Before pineapples are planted, a handful of biochar is put in planting holes. Biochar promotes the proper root formation and growth, it also improves on the size, amount of juice and the sugar levels of the fruits.

3.2 Biochar in vegetable nurseries

Biochar can be used as well in vegetable gardens. Biochar is mixed with topsoil and sand in nursery bed before planting seeds in nursery. It helps the seedlings to grow vigorously and escape pest and disease attack.

Figure 7. Vegetables raised in nursery bed with biochar

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