Simple Biochar Production

Carbonization of agricultural or forestry residues

Based on Quirino W. F. (2003) Utilizacao energetica de residuos vegetais. Laboratorio de Produtos Florestais LPF/IBAMA, pp 1-35

There are many ways to carbonize biomass. The mechanism is combustion under partial exclusion of oxygen.

Factors influencing the quality of charcoal:

Wood

- Density
- Humidity
- Size of pieces

In the process

- Final carbonization temperature
- Velocity of carbonization
- Control of oxygen supply

Oil barrel carbonization:

Open a slit of 20cm into a 200 liter oil barrel of good quality (Figure 1)

Place the barrel on the ground. The opening should be placed parallel to the wind and in about 20cm height. Fill some highly combustible biomass in the barrel to light the carbonization (Figure 2).

Rise the slit for about 10cm and fill the biomass intended to be charred (mainly coconut residues are used). Repeat this operation until the barrel is completely filled and the slit is on the top.

Close the opening with the peace of metal cut out at the beginning and turn the closed slit down towards the soil. Use the soil to prevent any entrance of oxygen (air) (Figure 3). Let the barrel in this position for about 5 hours. Do not open until the barrel cooled down (Figure 4).

Oil barrel carbonization in vertical position

Oil barrel with lid and wells at the bottom.

Light a fire below the barrel. When the carbonization is initiated seal the bottom of the barrel with soil and wait until it cooled down to remove the charcoal.

Modifications:

Barrels with smokestack and lateral air (oxygen) control. The openings can be jammed with clay. On the left are two coupled barrels to increase the production capacity.

Links

This method is using barrels and the volatile gases as a fuel. This is burning CH4 (a component in the gas stream and a potent greenhouse gas).

Read more

More pictures....

"Iwasaki-type high-speed charcoal kiln"