



GeaSphere

GUIDE TO

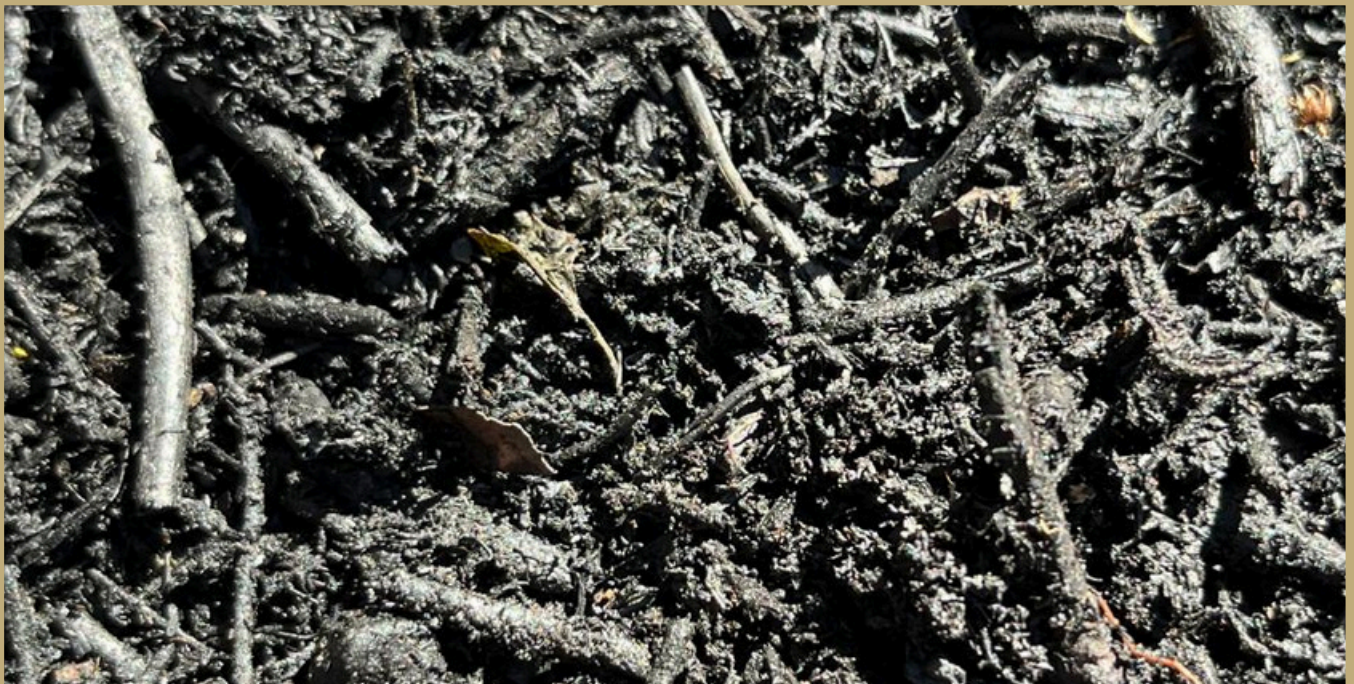
MAKING FLAME CAPPED BIOCHAR IN A 55 GALLON DRUM

SAFETY FIRST:

- Always prevent fire risk by working in a fire-safe area with no flammable materials nearby.
- Work within a contained vessel, such as an open-topped 55-gallon drum, and ensure basic fire-fighting equipment and water are readily available.
- Operate in a well-ventilated space and wear heavy-duty gloves and appropriate personal protective equipment (PPE).

MATERIALS NEEDED:

- Open-topped 55-gallon / 220L Drum (preferably with lid)
- Gloves
- Biomass: Gather any kind of biomass like garden or agricultural waste. Ensure it's as dry as possible and cut into smaller pieces (approximately 25cm in length and 3cm thick or smaller).



METHOD:

- **Prepare the Drum:**

Tilt the drum against another drum or suitable support.

Start the Fire: Begin with a medium fire at the bottom of the drum, using enough biomass to ignite well.



- **Add Layers:**

Once the biomass is burning properly, add another layer of biomass. Ensure each layer ignites and catches fire evenly.



- **Maintain the Flame:**

Keep adding dry biomass layers, ensuring the fire never reduces the char to ash. The frequency of adding layers depends on the type, consistency, and moisture content of the biomass.

- When the drum is full, carefully tilt it upright and add the final layers of biomass. Once the final layer is burning and white ash starts forming, cap the drum or douse the fire to extinguish it completely. If the drum is 'capped' and the fire 'smothered', allow the char to cool for at least 12 hours.



- **Inspect and Process:**

Inspect the finished biochar product and remove any partially charred biomass. Crush the biochar to smaller particles based on the intended use.

OPTIONAL INOCULATION:

If the biochar is intended for use as fertilizer, inoculate it by mixing it with compost and allowing it to sit for a week or two. This ensures beneficial microorganisms and nutrients from the compost are absorbed by the biochar.



SAFETY REMINDER:

Ensure the char is completely extinguished before handling or storing, as even small embers can reignite the batch.

Preferably quench the entire batch to eliminate potential re-ignition and prevent char dust.

HAVE FUN – SAFETY FIRST !

CREATING

THE PYROLYSIS EFFECT:

Pyrolysis is the chemical decomposition of organic materials at elevated temperatures in the absence of oxygen.

In the 'flame capped' method, the flames above the biomass prevent oxygen from reaching the lower layers, which initiates pyrolysis. Instead of combusting into ash, the biomass undergoes thermal decomposition, producing biochar. This method effectively converts biomass into biochar while minimizing the loss of carbon through combustion.

