

Is biochar an option to use in your biodynamic garden?

What is biochar and how is it made?

Biochar is a high-carbon, fine-grained residue that is produced via pyrolysis; it is the direct thermal decomposition of biomass in the absence of oxygen (preventing combustion), which produces a mixture of solids (the **biochar** proper), liquid (bio-oil), and gas (syngas) products. **Biochar** has been intentionally produced and utilized for several thousand years and is best known as **charcoal** (when produced from woody biomass).

Historic use of Charcoal or Biochar

We know the Incans in Peru used it in their terraces to build long lasting soils, as analysis has found that in Machu Pichu the black soils were generated, possibly over centuries, by the inclusion of charcoal creating deep fertile soils, as well as in other places like in the Amazonas.

The Incas lived in high density population in those areas where the charcoal was found in the soils, I assume they didn't make charcoal specifically (which is wasteful, as we do now with biochar where as much as 2/3 of the carbon and energy the wood has accumulated from the sun over decades is lost). Instead, we presume, each time they emptied their fire pits they had charcoal and ash mixed and dumped it all on the beds, then over time the ash disappeared, the charcoal being stable it accumulated in the soil and left behind black very rich soils.

Cost of biochar?

The market cost for biochar is about £ 600 per ton, that is roughly 50% of the price of activated carbon (£ 1150 per ton).

Why use biochar (charcoal) in your garden?

If you start a new garden on very **sandy or silty soils**, with no structure, poor in humus, nutrients and water, charcoal can absorb many more times the water and nutrients compared to humus and so can help humus accumulate too.

If you are in a **heavy water-logged, clay soil**, biochar will help to create drainage and aeration and alleviate the acidity in soils, generally speaking.

If charcoal is applied it raises the pH and even more so with ash. If it is applied without ash or other organic composts, as can be seen in the commercialisation of biochar in 'Carbon Gold' £ 50/ 20 kg (application rate), it will actually rob the soil of Nitrogen and other nutrients. Therefore biochar is usually sold **as a mix with fast return compost with a high nutrient content and charcoal**.

Benefits of Biochar

- Increase of pH makes available nutrients from the rest of the soil
- Fixes heavy metals and other poisons in the soil, like agrochemicals
- Increases and improves water holding capacity
- Reduces water run-off in compacted soils
- Increases vegetable and plant growth
- Refuge for natural soil biology (micro-bacteria and fungi)
- Improves nutrient retention in soil

- Breaks up compacted soil
- Locks carbon in the soil for centuries
- Offsets your carbon footprint (1kg of biochar sequesters 3kg of carbon dioxide)

Disadvantages of Biochar

- It increases break down nutrients in the soil
- It absorbs nutrients from soil
- It denitrifies Nitrogen (NO₂) into N₂ which is a gaseous form of nitrogen, meaning it can deplete soil of nitrogen, if without the supporting presence of rich micro flora and other forms of carbon, like stable humus.

Makes sense?

Working with the biodynamic preparations, green manures, crop rotation and a high diversity crops of deep rooting and fibrous root systems, we can accumulate biomass (organic matter) with less cost and waste of wood being sacrificed to make biochar, unless we make our own. We can choose to look for alternatives for making charcoal like bracken or gorse and other invasive species, who destroy biodiversity in the heather habitats and pastures of farmland.

So, take it with a pinch of salt if you work biodynamically, as we are looking to create life activity from the soil upward, via the microbes, plants and animals and we work to help mediate and connect the cosmic influences so that the 3 kingdoms are present in our garden environments to create self-sustaining abundance without importing organic material from outside our living garden and farm organisms. Charcoal has its uses: Biochar when used effectively with compost can help needy soils in particular.

Try making charcoal and do it with your children. It is fun, but wasteful if applied on large surfaces or a large scale with materials that have other uses. (IE we do not recommend you use materials you have better uses for – firewood, compost, etc.)

You could of course invest in a biochar woodstove and make your own biochar, while using the waste heat produced in this reduction process (exclusion of Oxygen) for heating your house in winter.

Happy days with regenerating soils however you deem best.

Hans-Günther

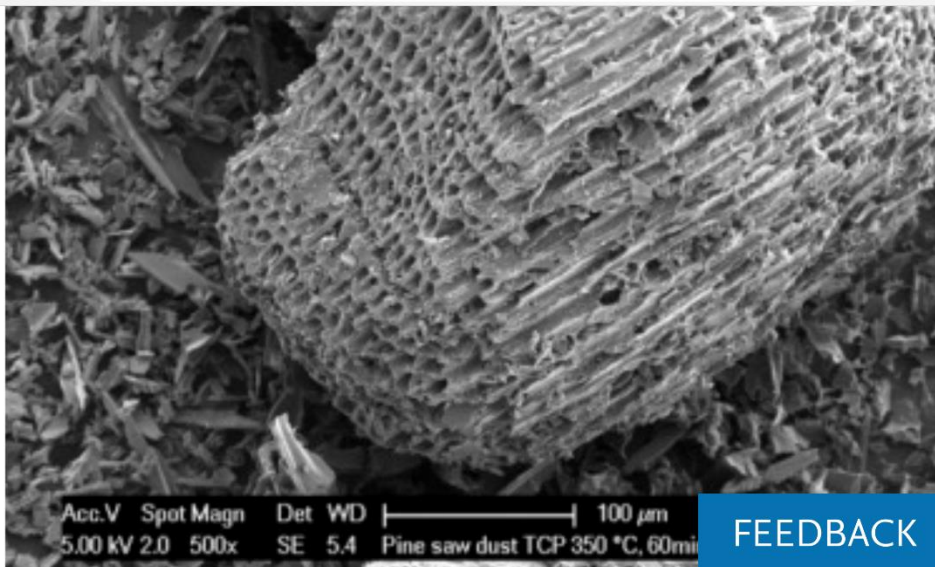


Pine wood chips

Pyrolysis with low supply of oxygen
(700 °C)



FEEDBACK 



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