



CaRBOLIVA

biocarbón sostenible

Biochar

For a sustainable planet



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01. Introduction

Definition

🌱 Biochar is a carbonaceous material produced from the pyrolysis of biomass, i.e. the thermal decomposition of organic matter in the absence of oxygen. This process converts biomass into a stable carbon that has various beneficial applications for the environment and agriculture.

History

🌱 Although the term "biochar" is relatively new, the use of charcoal to improve soils has a long history dating back to the agricultural practices of pre-Columbian civilisations in the Amazon. The indigenous peoples of this region produced a type of fertile soil known as "terra preta" (black earth) by adding charcoal and other organic materials to the soil. This soil was noticeably more fertile than the surrounding soil, allowing for more productive agriculture.

Developments

Research on biochar intensified with a focus on its potential benefits for sustainable agriculture and climate change mitigation. Studies focused on how biochar can **improve nutrient and water retention in the soil, as well as its ability to effectively sequester carbon.**



02. Who are we?



CARBOLIVA manufactures 5,000 tonnes per year of biochar from olive pulp and pits supplied by Coosur at its Puente del Obispo extraction plant.

It is a **totally ecological product** and we are the only company in the world that manufactures Biochar from this biomass.

We use a pyrolytic furnace, which heats the biomass indirectly, without allowing it to come into contact with oxygen so that it does not burn to ash.

We produce clean thermal energy and **BIOCHAR** which is a great help to bring life back to desertifying soils.



Our Certifications



03. Production process biochar

Raw materials

🌱 In our case we use the **pit and the olive pulp**.

Characteristics of Biochar

- 🌱 **Stability:** Biochar is highly stable and can last in the soil for hundreds of years, unlike other organic materials that decompose more quickly. Other organic matter only lasts in the soil for 2 or 3 years.
- 🌱 **Porosity:** Its porous structure allows it to retain nutrients and water, thus improving soil properties.
- 🌱 **Cation Exchange Capacity:** It has a high cation exchange capacity, which means it can efficiently retain and release nutrients.

Production methods

- 🌱 **Fast Pyrolysis:** High temperature, short residence time.
- 🌱 **Slow pyrolysis:** Low temperature, long residence time (most common to produce biochar).



04. Properties of biochar

Physical

- 🌿 High porosity.
- 🌿 High specific surface area.
- 🌿 RECALCITRANT, can persist in the soil for hundreds of years.

Químicas

- 🌿 Alkaline pH.
- 🌿 High cation exchange capacity (CEC).
- 🌿 Presence of nutrients such as **potassium** (10-15%), calcium and magnesium.



05. Diversity of uses biochar

Raw materials

- 🌱 Agriculture: soil and crop improvement.
- 🌱 Substitute for coal and petroleum coke in industries.
- 🌱 Air and Water Purification.
- 🌱 Tree Regenerator on urban land.
- 🌱 Briquettes for barbecues and cookers.
- 🌱 Animal feed additive.
- 🌱 CO2 reducer in cement and building materials.
- 🌱 Reclamation of contaminated soils.
- 🌱 Energy Producer.
- 🌱 Metallurgical sector.
- 🌱 Carbon sequestration and emission reductions.



06. Benefits of biochar in agriculture



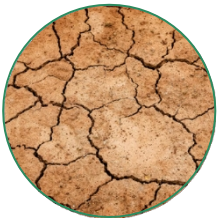
Improving soil fertility

📦 **Nutrient retention:** Acts like a sponge that retains nutrients and releases them slowly.



Improved microbial activity

📦 Provides habitats for beneficial microorganisms that promote the soil health such as mycorrhizal fungi.



Increased water retention capacity

📦 The porous structure of biochar helps to **retain water**, as much as its own weight, thus reducing the need to irrigate. It also helps to reduce runoff and leaching.



Greenhouse gas reduction

📦 Biochar increases **carbon sequestration** in the soil, sequestering C and reducing the C that is emitted to the atmosphere. (CO₂), helping to mitigate climate change. **It reduces the emission of gases** such as nitrous oxide and methane from the soil.





Economic

🌱 The carbon will remain stored in the soil for hundreds of years, given the stability of biochar, so **you only have to apply it once** and it is no longer a recurring expense like other organic fertilisers.



Increases productivity

🌱 **Productivity increases** in various crops are obtained by directly modifying the soil chemistry due to the composition of the biochar and also by physically modifying the soil in a way that **benefits the soil**.
root growth and increases water and nutrient retention.



Absorbs pesticides and heavy metals

🌱 It has been shown that biochar can **retain metallic elements or pollutants**. It can favour the absorption of organic compounds such as herbicides or pesticides, thus helping to avoid harmful effects in the short and long term.



Avoid deforestation

🌱 Our biochar avoids deforestation because it is derived from the fruit of olives and **not from the felling of trees** as is often the case with imports of other biochars.



07. Comparative images of soils

1. Soil structure comparison



Soils without Biochar



Soils with Biochar



2. Comparison of water retention



07. Comparative images of soils



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3. Comparison of crop yields



4. Root activity comparison



08. Practical applications of Biochar

Methods of application

- It is HIGHLY recommended to "enrich" the biochar with compost or fertiliser. Applied directly to the soil in furrows or holes, although the ideal is to bury it.

Recommended doses

- Generally, 1 to 3 tonnes per hectare is recommended, depending on the type of soil and crop. It will only need to be applied once.

Examples of crops beneficiaries

- Crops such as olive trees, almond trees, vineyards, strawberries, berries, wheat, cabbage and various vegetables have shown significant yield improvements when biochar is used.

Ultraporous

- One kilogram of Carboliva's ultra-porous biochar has a surface area equivalent to more than 20 football fields. Water adheres to these surfaces to retain moisture in the soil up to six times longer. The microscopic pores also serve as a habitat for microbiota, creating a mega-factory of microorganisms in the soil.

A living soil

Nothing new

The use of biochar is a widespread practice in the USA and many European countries (Germany, France and the Netherlands among them) because of the many benefits it brings to crops.



09. Considerations



Quality of biochar

📦 Quality may vary depending on the biomass and the production process (pyrolysis).

Not all biochar is equally porous and does not contain the same amount of carbon.

In our case, the olive biochar is of excellent quality.



Cost and availability

📦 Although biochar can be costly to produce initially, the long-term benefits outweigh the costs as well as the need for a single initial application.



Ongoing research

📦 Studies are underway to optimise production and application techniques, as well as to better understand long-term impacts in different soil types and climates.



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