Biochar Made Simple for Home Gardeners

This learning module is designed to help you understand how to use biochar to build healthier soils and grow better kai, while supporting your soil food web for nourishing your whānau with healthy homegrown Kai.

1. What is biochar?
Biochar is a specialized form of charcoal made from organic materials like wood, branches, garden prunings, or even animal manures. What makes biochar different from ordinary charcoal is its incredible internal structure. During production, high temperatures create millions of microscopic pores and an enormous internal surface area.

To understand how something so small can be so powerful, think of a sponge. A sponge can hold far more water than you'd expect because it is full of tiny holes; biochar works the same way, but its pores are microscopic. To put this in perspective, a single teaspoon of high-quality biochar can have a surface area similar to a rugby field because of all those hidden microscopic pores, tunnels, and chambers.

2. How biochar is made
Biochar is produced through pyrolysis, which involves heating dry organic material in a low-oxygen environment. Because there is little to no oxygen, the material doesn't burn away to ash; instead, moisture and gases are driven off, leaving behind a stable, carbon-rich structure. The higher the temperature during this process, the larger the internal surface area created, which distinguishes high-quality biochar from ordinary charcoal. This process takes materials that might be wasted and turns them into something that locks carbon away for years.

3. Why biochar benefits soil
Biochar is a long-term investment in healing the soil and growing good kai.

A Permanent Microbe Home: It provides a long-term home for beneficial bacteria, fungi, and other soil life. Think of these pores as "little bungalows" where microbes can thrive, stay safe, and help cycle nutrients to support healthy plant growth.

Nutrient and Water Storage: Those tiny pores act like a sponge, helping the soil hold onto moisture and nutrients rather than letting them wash away.

Carbon Sequestration: It takes carbon that would have been released into the atmosphere and locks it away in the soil for hundreds of years.

4. Biochar vs. other forms of charcoal
It is important to use the right material for your garden to avoid doing more harm than good.

Barbecue Charcoal: This often contains fuels, additives, or binders and should never be used in your garden.

Home Fireplace Charcoal: This can be used if you only burned untreated wood. Using this will still benefit your garden—even the ash has benefits for the soil. However, it generally has a much lower surface area than high-quality biochar because it wasn't produced under controlled, high-temperature conditions.

High-Quality Biochar: This is specifically produced at high temperatures to maximize the internal surface area and pore structure for soil improvement.

5. The importance of charging biochar
One of the biggest mistakes is digging biochar straight into the garden. Fresh biochar is like an empty sponge; if you put it straight into your soil, those empty pores will soak up the nutrients that are already in your soil, potentially starving your plants in the short term. Charging is the process of pre-filling those microscopic pores with nutrients, moisture, and beneficial microbes before adding it to the garden. Once charged, biochar acts like a soil battery, storing these essentials and making them available to your plants over time.

6. How to charge biochar
The goal is to fill the pores with "the good stuff" before it hits your garden beds.

Biology: Add compost, compost tea, or worm tea to introduce beneficial microbes and nutrients. This helps fill the "bungalows" with the bacteria and fungi that create healthy soil.

Nutrient Boosters: Use animal manure, seaweed fertiliser (for trace minerals), and fish emulsion (for nitrogen).

Hydrate: Add enough water to keep the entire mixture moist and like a wet slurry. As the biochar draws in the water, you may need to add more. It is best to use unchlorinated water so you don't kill off the beneficial microbes. Rain water is a great choice, or you can leave a bucket of tap water in the sun for a day so the chlorine burns off.

Let it Breathe: Leave your bucket or container uncovered and give the mixture a stir every so often. This allows oxygen to circulate, which helps beneficial microbes thrive and prevents the mixture from becoming anaerobic (smelly and oxygen-depleted).

Wait: Mix everything together and leave it to sit while the biochar absorbs those nutrients and microbes. The longer it sits, the more opportunity there is for those pores to become fully charged. We recommend a minimum of 5 days, but it can be left as long as needed—just remember to add water if needed to keep it a slurry and give it a good stir now and then.

7. How to use biochar in pots and garden beds
Charged biochar is one part of a healthy soil-building system.

Kai Pots, Garden Pots and Grow Bags: Mixing it directly into your potting medium.

Garden Beds: Incorporating it into raised beds or traditional rows.

Conclusion

Biochar is a simple but powerful tool for building healthier soils. Its millions of microscopic pores help store water, nutrients and beneficial microbes, creating a long-term support system for your soil food web.

When charged with compost, nutrients and biology before use, biochar acts like a soil battery, helping create resilient soils that grow healthy plants and nourishing kai for years to come.

Whether you're growing in Kai Pots, grow bags, raised beds or a backyard garden, biochar can be part of a sustainable approach to caring for the earth while supporting the health of your whānau.

Tee's Pots is based in the Waikato and supplies quality biochar for home gardeners, growers and soil enthusiasts. Biochar can be couriered New Zealand wide.

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