GARDENING WITH BIOCHAR

by

maccybiochar

A Task Group of the Macclesfield Community Association Inc.
c/o PO Box 535, Macclesfield SA 5153
Email: maccybiochar@adam.com.au
Website: https://www.maccybiochar.com

Maccy Biochar is a community-based, not-for-profit group set up to help make Macclesfield carbon neutral and is run entirely by volunteers. Our primary activity is the production of **carbon-negative biochar** from woody tree litter sourced from local households, businesses and landowners. The biochar we make is sold in bulk for local agricultural and other similar uses thereby ensuring that the carbon we have captured is properly sequestered and helping to improve local soil fertility for years to come.

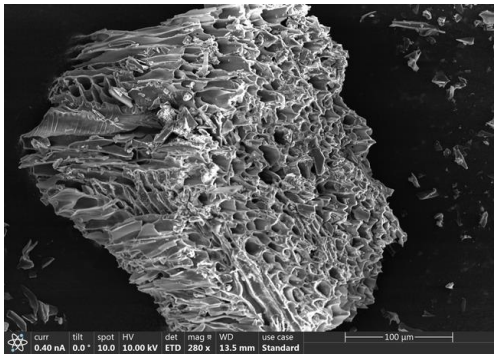
Biochar is a form of charcoal and is good for the soil and combats climate change by sequestering carbon.

HOW DOES BIOCHAR HELP THE SOIL?

Biochar has a very porous structure that facilitates water absorption and adsorption of water-borne nutrients. So when biochar is mixed into the soil it helps the soil retain water and nutrients thereby reducing water consumption and increasing plant yields.

Biochar is extremely porous (see photo opposite) and can hold about 3-5 times its own weight of water. When mixed into the soil in small proportions (5-10% by volume) moisture and water-borne nutrients are held and encourage growth of micro-fungi and other living organisms.

Biochar particles are also extremely tough and so do not readily break down in the soil. The porosity of the soil is therefore increased which assists with aeration which in turn also helps to improve the health of soil life.



All this helps to improve plant yields; reduce water consumption; and reduce the need for fertilisers. In turn the multiplier effect of increasing soil life is to further increase soil carbon and therefore fertility.

As the biochar does not readily break down it will remain in the soil for many hundreds of years. So the benefits to the soil are ongoing.

Quenched biochar:

Quenched biochar is pure, unadulterated biochar that has come directly from the kiln after being thoroughly quenched with water. The quenching process enhances the porosity of the char by fracturing and allows it to absorb up to 5 times its own weight in water. A lump of biochar will initially float in water for a few days but will readily absorb water until it finally sinks.

Note: Unquenched char such as charcoal from a bushfire or from your wood combustion fireplace will often take much longer to absorb enough water to actually sink in water because any unburnt tars held within the char will repel water.

When raw biochar is buried in the soil it will absorb water and adsorb nutrients from the soil in its immediate vicinity. This can initially rob plants of some water and nutrients until the roots of the plant “discover” the biochar. This has been termed the **J-curve** effect referring to the sometimes decreased yield prior to the increased yield of the plants sometime later.

Typical flame-capped kiln for garden use

Handling & Storage: Biochar can have fairly sharp edges so best to use gloves when handling it. Also keep it damp to avoid it becoming dusty or wear a dust mask when handling it. And never try to burn biochar; carbon monoxide (a deadly gas) will be emitted and the carbon will be returned to the atmosphere.

Enriched biochar:

Enriched biochar is quenched biochar that has been enriched with nutrients such as that available from good soil, worm tea, animal manure etc. The enriching process enhances the ability of the char to attract the bacteria and fungi sought after by plants. Use of enriched biochar will therefore tend to avoid the so-called J-curve effect associated with raw biochar.

Enrichment process:

The enrichment process can vary from the sublime (such as simply mixing with your best soil) to the complex (such as mixing with soil, rock dust, manure and bacteria for a prescribed period underground or in a mixing chamber). Every producer of enriched biochar will have their preferred method.

Potting:

Place raw quenched biochar (approx. 25% by volume) at the bottom of the pot. Use lump biochar in your large pots; and granules in your smaller pots. Mix enriched biochar (5-10%) by volume with your potting soil.

Tree Planting:

Mix granular quenched biochar (5-10% by volume) with the soil from the hole you have dug for your tree together with some of your preferred plant nutrient or organic fertiliser, eg. cow manure. Or use the same amount of enriched biochar without the further added plant nutrients.
Alternatively add the nutrients in liquid form after planting the tree and backfilling.

Garden Beds:

Prior to planting out apply a layer of 50% compost-50% enriched biochar to the planting zones and mix into the soil.

Alternatively you can make a slurry of enriched biochar with water and trickle that into the soil in the planting zones.

Lawns:

Top-dress with biochar where needed (eg severely compacted or worn areas) and water in.

Food scraps bin:

Throw a handful of quenched granular or powder biochar into the bottom of your food scraps bin before use and you will find that the odour of rotting foods is greatly reduced.

Compost heaps:

Add quenched granular biochar to your compost heap (either directly or via the contents of your food scraps bin) to improve the water-holding capacity of your compost and to enrich the biochar. The addition of biochar to the compost will also reduce the amount of methane emitted by the rotting food.

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