

SEVERAL WAYS TO USE BIOCHAR ON THE FARM OR GARDEN

Biochar matures over seasons in the soil or in just weeks in a compost environment. While maturing, organic acids, minerals, soil particles, and living organisms further complicate, or change the surface of biochar, aiding in its functionality and beneficial qualities.

Adding fresh and raw biochar to soil can create a temporary nitrogen tie-up. For this reason, it is best if biochar is co-applied with composts, manures, or planting a nitrogen-fixing legume crop with it. When combined with compost piles, relatively small amounts of biochar can significantly reduce nitrogen loss during composting, and help to support thriving microbial communities. The biochar also benefits from the compost process through increased complexity of its surface area and ability to transfer nutrients.

When biochar is made, there is usually some amount of ash (non-carbon minerals) also created. Although the majority of biochar is a neutral and non-reactive carbon, ash is alkaline. Ash can be great source of plant nutrients, except nitrogen. But in alkaline soils, it must be used only sparingly. "Liming capacity" or "calcium carbonate equivalent" is the most useful measure of a biochar material's potential pH impact on soil, as it can account for both the pH and concentration of ash in a biochar material.

Biochar works as a catalyst and unlike plant nutrients, it does not travel much. Where biochar is applied to the soil is more or less where it will stay until disturbed by soil life or human activity.

When storing biochar, keep it wet or keep it covered. Dry biochar is a nuisance to work with and can potentially become a fire hazard.

Application rate suggestions: (shown as % by volume unless stated otherwise)

To improve compost

- 5% to 10% biochar added at start of compost pile
- 10% to 20% when compost N is excessively high

Applied with compost

- 10% to 20% biochar to compost for regular maintenance
- 20% to 40% for major events (deep tilling, field prep, etc.)
- Allow the blend to cure for several weeks before planting if possible

Manure management (to reduce odors and nutrient loss)

- 10% of animal bedding
- Thin layer over manure lagoons
- Thin layer over fresh manure in layered compost

Planting backfill

- 10% to 20% of backfill
A blend of biochar, compost, and minerals blended with the removed soil to achieve desired rate of regrowth.
- A few handfuls in the bottom of the hole with minerals and inoculants

Mulch layer

- 1/16" to 1/8" of biochar, sprinkle with organic fertilizer, cover completely with mulch. Repeat as desired.
- Blend biochar with mulch at 5%, add fertilizer as desired, apply in one pass. Repeat as desired.

Seed rows

- Compost and biochar blend can make a great seed blanket. Trench the line, lay the seeds, blanket with blend.
- Works best with properly aged compost/biochar blend. Rock powders and microbial inoculants are good additions.

Broad acre, annuals

- Aim for 5% to 10% by volume of cultivated topsoil
- Can be done incrementally over years
- 1/4" layer of biochar tilled into the soil 5" deep will achieve 5% by volume
- 1/4" layer of biochar covering one acre is 33 cubic yards

Broad acre, orchards and vineyards

- If deep cultivation of planting row will be done, incorporate biochar to depth before planting.
- Incorporate biochar in aisles for better cover crop growth.
- In both situations, a rate of 5% to 10% by volume is suggested.

Potting media

- 5% to 10% by volume is common
- Lining the bottom of the pot or planting bed with biochar can be beneficial
- If ash is flushed away and nutrients are sufficiently added, biochar can be used as the sole media, as is sometimes practiced with orchids.

To amend soil during cultivation

- 5% to 10% of the topsoil
- If cultivating to 5", then 1/4" tilled in yields 5% by volume
- 4 tons per acre for vineyards and orchards
- 10 tons per acre for intense row crop
- If plain biochar is used without compost or fertilizer in combination, it is best to follow amendment with a legume cover crop for nitrogen fixing.