

Applying Biochar



Living Web Farms

Application

- Little science in terms of hardline recommended rates
 - All variables all the time
- Again, biochar is not fertilizer, and if applied without sufficient nutrients or organic matter and time for microbes to process, *short term* negative results are likely
- Some studies show that too high of applications can have no or negative results - 10% or more (by weight)
- Does not need regular applications.
- It is believed that synergistic benefits of biochar in the soil increase over time

Application Rates

- Suggested ranges:
 - .25-2.5% by weight (moisture content will dramatically affect this)
 - 1 - 10% by volume (a more reliable way to buy biochar, esp. when shipped)
 - 2-20 tons/Ha, 5-50 tons/acre
- For raised bed gardeners, container growers, higher rates are more attainable.
 - 5 gallon increments are easy for me, as a small gardener, to work with
 - 20 gallons small particle char, at 100 sq ft. is roughly 5% biochar, tilled 6" deep
 - One yard is 27 cu ft. One gallon is 0.133 cu.ft., One 5 gallon bucket is $\frac{2}{3}$ cu.ft.
 - 41, 5 gallon buckets in 1 yard.

Best Practices

- Moisten char prior to spreading, keep moist until incorporation
 - When handling dry char use P100 filters, fitted mask
- Spread on calm days
 - Consider wind and water erosion losses
 - Also consider UV light
- Cover char: incorporate, mulch ASAP
 - To prevent losses, UV exposure, drying
- Fitted mask respirators
 - We like 3M masks, with P100 filters
 - Low-cost cartridges for other specific applications



Uniform Topsoil Application

- After primary prep when establishing new gardens, lawns, landscaping after construction.
- Dry or slurry, lime/manure spreaders, disk or till in
- Studies show results at as little as 5 tons/acre (thickness of a dime)
- My new vegetable beds:
 - Spring 2015, 1st Application: 15 gallons in 60 sq.ft.
 - Fall 2016, 2nd Application: 8 gallons in 60 sq.ft.
 - (23x.133)/30ft³ (when incorporated 6" deep)
 - 10% by volume at 6" deep
 - Tilled in 10", for the last time.
 - Closer to %6 biochar/cu.ft.



In the hole

- When establishing new berries, trees, landscape plants
- 1-10% by volume
- Think heavier applications, larger radius holes.
- Larger pieces (still ¼” or less) likely serve as a better habitat for fungi... get em in there!
- Ideally, apply to the dripline using banding techniques
- Trenching techniques encourage roots to move out of the hole



Around established perennials

- Banding, spade and spread, around dripline
- Trench and fill
- Reduce risk of water erosion: Take care to make sure char is 'wetted' prior to topdressing
- Slurry application, spray application of fine char powders
- Top-Dressing, or surface application
 - Ensure char is wetted prior to application, reduce runoff and wind erosion
 - Apply immediately prior to mowing cover crop, or mulch immediately
 - Incorporation into soil is left to natural soil buildup and movement from biological activity
 - Pat says charging biochar with choice nutrients (ex.calcium) may encourage quicker incorporation



Prarie application w/deep banding machinery
Source: biocharapplication.com

more....

- In potted plants: properly charged biochar may act as a renewable alternative to peat, perlite, and vermiculite.
- Biochar can act as a bulking agent, allowing even delivery of small amounts of nutrients over large areas
 - Soil test for micronutrients recommended before amending large areas
- Adsorptive properties make it an effective media for blending and delivering other fertilizers
 - Small amounts of char can be added annually, to reduce losses of fertilizer applications
- Mycorrhizae and other powdered fungi inoculants (root zone) can be added prior to application

References and Resources

- **Application Guidelines:**

[http://www.biochar-international.org/sites/default/files/IBI%20Biochar%20Application%20Guidelines web.pdf](http://www.biochar-international.org/sites/default/files/IBI%20Biochar%20Application%20Guidelines%20web.pdf)

- **Conversion Factors:**

<http://greenyourhead.typepad.com/files/formulas-and-conversion-factors-for-working-with-biochar.pdf>