BIOCHAR: a sustainable soil amendment

What is Biochar? – a solid, carbon-rich material intended for soil application to improve soil quality and crop productivity while sequestering carbon.

How is it made? – **Pyrolysis**: the thermochemical decomposition of organic material by heating in the absence of or under very low oxygen conditions.

Where to apply biochar? – numerous agricultural and horticultural applications! Biochars blended with fertilizer, compost, manure, or other nutrient rich products have shown to have the greater positive benefit when applied. Liquid and solid biochar products available for different applications.

- **Farms:** sandy, low fertility, and degraded soils
- Maintenance of **lawns**, **landscapes, gardens, turf, flower beds, tree plantings**

Potential Benefits of Biochar

Increased	*Decreased*
Soil water retention	Nutrient leaching/run-off
Microbial activity	Compaction
Infiltration	Disease severity
Porosity	Soil toxicity
Soil fertility/structure	Odors
Aeration	Greenhouse gas emissions
Crop growth	Fertilizer use (input costs)
Cation exchange capacity	Bulk density

Additional Information:

1. **Site and product variability –** the potential benefits of biochar application are largely dependent on soil and biochar type, environmental conditions, application rate, and time. Each organic material (feedstock) produces a different biochar type that may result in variable crop growth and environmental responses. Specific biochars are being created for specific applications. Use high-quality biochar products only. Testing standards exist.
2. **Application Rate** – Varies depending on type of application. Can mix with fertilizer. **More is not always better!**
   - Garden soil/flower bed: incorporate no more than 10% (v/v) biochar or 50/50 mix of biochar+compost at 1/4 lb/ft^2
   - Lawns: rake in 1 cu/ft bag of biochar over ~350 sq/ft
   - Turf: Injected or liquid spray at 5% (v/v)
   - Farm fields: 1-10 t/ac. Higher rate not economical but small applications can be made annually.
3. **Availability and Cost** – Cost varies depending on quantity and biochar product. Availability has increased greatly over the last few years. See list of biochar supplies and manufacturers here: https://biochar-us.org/suppliers-and-manufacturers

Reliable resources for biochar information:

United States Biochar Initiative (USBI) - https://biochar-us.org/
International Biochar Initiative (IBI) - http://www.biochar-international.org
Cornell University - http://www.css.cornell.edu/faculty/lehmann/research/biochar/biocharmain.html

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