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Using biochar to create artwork in the landscape

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Biochar is mostly composed of highly stable forms of black carbon and it can be used as a tool for carbon sequestration in soil. There is also interest in using biochar to create permanent landscape art, including as part of projects (such as 350.org) aimed at raising public awareness about climate change mitigation. This is a relatively new idea, and this Technical Bulletin is intended to provide ideas for creating biochar designs in the landscape. It also lists precautions which must be taken when embarking on such projects.

For instance, you should always test your biochar first to make sure it will give you the result you want. See IBI Technical Bulletin #101: *Quick tests to determine whether a biochar material contains compounds that are potentially harmful to plants.*

1.0 Ideas for creating biochar art in the landscape

It is possible to create very large biochar designs that could be seen from the air, however, as with any new material it is best to start small. Smaller biochar designs can be made to be viewed from the ground. The design may be viewed from an elevated observation point, or it could be placed on a slope. Working on slopes might represent a challenge, since as noted below, biochar can be very light and can be moved around by rainwater and wind.

2.0 Growing the design

Biochar is black but often leads to greener plants. A "green design" will show up most dramatically on a poor soil. Areas near roads and those where topsoil was removed during construction and not replaced generally have poor soils and are good choices for locating a biochar design.

Start by tilling up a patch of ground larger than your design. Incorporate biochar into the soil within the pattern or design, and then seed or transplant over the larger area which includes the design. If biochar improves plant growth, the design will be visible, through the plants, more or less clearly. You can also top-dress biochar over a design that is traced out on an existing pasture or turfgrass lawn.

This picture illustrates the result of adding patches of biochar to a turfgrass field. Although not deliberately intended to make a design, the grid pattern shows how biochar changes the color and growth of the grass – making a design.

Top-dressed biochar on perennial pasture in England, visible as darker treated square plots. (Picture by A. Gathorne-Hardy)

Appropriate plants to use for the design: A ground cover plant such as grass or clover will give the most visible result for your design. In the wet tropics, try forage peanut. Sow the crop over the entire area – both the biochar area and the regular soil. More expensive ornamental plants can also be used, and often must be transplanted. For advice on the best plants to use in your region, consult with a local expert at a garden center.

How to use biochar: In research and large-scale field operation settings, application rates for biochar are expressed in metric tons per hectare (t/ha). Rates of 5–50 t/ha have often been used successfully. For a smaller area, you may want to use kilograms per square meter. To do this, divide the t/ha application rate by 10. For example, If you decide to apply at the 10 t/ha rate, divide by 10 to get 1 kg/m2.

Depending on your soil, type of biochar and the plants you use, you may also want to add some fertilizer to the biochar before or after applying it. For a comprehensive guide to using biochar in soil, see the IBI publication, *Guide to Conducting Biochar Trials*, available at www.biochar-international.org/publications/IBI.

Top-dressing biochar: Biochar can be top dressed on perennial pastures or other perennial vegetation. This type of application makes amendments subject to losses, but it is routinely used to apply manures, compost, and synthetic fertilizer to restore fertility in perennial systems. Surface application of biochar to perennial pasture has been done successfully in England without any visual observation of significant losses of biochar, and with observation of incorporation of biochar into the soil by earthworms. However, data on biochar movement with surface application to perennial vegetation is lacking.

3.0 Precautions when working with biochar in landscape art

Always test your biochar first: Make sure it will give you the result you want. See IBI Technical Bulletin #101: *Quick tests to determine whether a biochar material contains compounds that are potentially harmful to plants,* available at www.biochar-international.org/publications/IBI.

Biochar and erosion: Biochar can be very light and can be moved around by wind and water. Biochar is more exposed to wind and water before vegetation has grown, so it is important to establish vegetation as quickly as possible. The best way to protect biochar from erosion is to thoroughly work it into the soil whenever possible. To protect exposed biochar from wind erosion, it helps to keep it moist until vegetation is established. To prevent biochar loss from water runoff, it is important to ensure that rainwater can rapidly drain from the design area. In regions with abundant rainfall, the biochar design can be laid on top of a surface that drains well, for example sand and/or gravel.