



News from the International Biochar Initiative

IBI is a non-profit organization supporting researchers, commercial entities, policy makers, farmers & gardeners, development agents and others committed to sustainable biochar production and use.

Help put the Earth **Back in the Black**

April 23, 2012

Balloting Opens for IBI's Biochar Guidelines

The final IBI ***Standardized Product Definition and Product Testing Guidelines for Biochar That Is Used in Soil***, referred to as the ***Biochar Guidelines*** document, was posted online on April 11, 2012 for final balloting. The ballot begins April 23, 2012, and ends May 6, 2012. Paying IBI Members in good account standing are eligible to vote in this ballot. All IBI subscribers will receive an email with a link to the ballot and several follow-up reminders before the end of the balloting period.

There is still time for those who are not yet IBI Members to join or renew their membership. Membership registration and payment forms are available at <http://www.biochar-international.org/join>. Balloting privileges will be extended to members after payment is received, so please join soon if you wish to participate in this ballot.

This final version of the ***Biochar Guidelines*** document is the result of a multi-year process, begun in 2009, that incorporates the work of a diverse set of global experts, practitioners, and public stakeholders who have participated in drafting, revising, reviewing and commenting on the ***Biochar Guidelines*** document. This work is now complete, and we are asking the IBI Membership to approve the final product. Once the ***Biochar Guidelines*** are approved, IBI will implement an IBI Biochar Certification Program.

Members should make sure that they have read the correct, final version of the ***Biochar Guidelines*** before voting. The ***Biochar Guidelines***, a set of FAQs, slides from IBI's informational webinar, and additional documentation and background information on the ***Biochar Guidelines*** process are posted on IBI's website at <http://www.biochar-international.org/characterizationstandard>

There are still spaces available in the final **IBI Informational *Biochar Guidelines* Webinar**. This free webinar takes place on April 30, 2012 at 10:00p.m. EDT (New York City) and is open to the public.

Reserve your Webinar seat now at:
<https://www3.gotomeeting.com/register/538739422>

IBI wishes to thank all who have contributed to the ***Biochar Guidelines***.

Profile: Creating a New Biochar Product in the Rocky Mountain Region: Bath Garden Center

Bath, Inc. has been operating in Northern Colorado (United States) for the past 42 years as a garden center, nursery, landscape and irrigation installation company. For the past eight years, Bath has strongly emphasized and promoted organic practices in all aspects of plant production. They work to continually educate both staff as well as customers in soil ecology and organic gardening. To this end, they offer organic products and soil amendments and dissuade customers from using toxic petro-chemical distillates such as chemical salt fertilizers, herbicides, pesticides, and fungicides, believing that an individual can positively affect global change, starting in their own yard. When Spencer Bath, the owner, first encountered the idea of biochar in Acres Magazine, it became evident to him that not only would biochar fit perfectly into the organic sustainability movement, but that disseminating the information on biochar would become a mission in itself.

Bath is both producing biochar onsite for sale to customers and conducting research. The Bath research team is led by Rick Holmes (M.A. Biochemistry), Spencer Bath, and James McManaman and is specifically examining how biochar can benefit the Northern Colorado climate and soil health, regenerative agriculture, the potential for alternative and renewable energy, and soil remediation. For onsite production purposes, Bath uses a slow-burn, top lit updraft (TLUD) kiln equipped with an afterburner flue. In addition to producing their commercial biochar product (Agricharge™) for sale through their store, the team is working on plans for diverting the excess heat in order to reduce dependence on natural gas heat for multiple greenhouse growing operations onsite. They are also designing a mobile TLUD kiln to create biochar from the vast areas of forest devastated by the pine beetle infestation. Fire mitigation of these areas is a preeminent concern for the Forest Service as well as the residents of outlying mountain areas.

As Bath has encouraged the organic method for customers, they have learned that embracing organics can be difficult for some customers who expect instant results. Petrochemicals can give the appearance of quick results, with the long-term consequences hidden in the suppression of soil microbes, pollution of air and water resources resulting from extraction and use of petrochemical fuels, and the increases of disease related to bioaccumulation of toxics in food chains and the environment. Bath believes that informing their customer base on these risks is essential to shifting to organic practices. They feel that biochar is conducive to this goal, as it may decrease the transition period from petrochemical dependency to organic stewardship. Says Spencer Bath, "In our experience evaluating consumer demand, we found the ability to see results in a short time to be paramount in opening the minds of more traditional customers to organics. We believe biochar offers an impetus for altering traditional chemical dependent cultural practices, as well as increasing the efficacy and viability of the organic approach in general."

To promote biochar to the community, Bath is disseminating information via social networks, small organic farms, farmer's markets, and municipal climate programs. They have seen a positive and surprisingly rapid response from customers and community partners alike and find that people are excited to experiment with biochar and continue educating themselves.

As the company increases production, they are working to adhere to the micro batch process, since they have found that the wood oils retained in the biochar serve a host of benefits to microbiological activity beyond the crystalline structure of the biochar itself. To better back the claims that are made about biochar and to ensure that their product is of good quality, the team has some laboratory equipment onsite including trinocular dissection microscopes, a centrifuge, and a color spectrometer. They are also utilizing outside testing facilities such as the Soil Food Web lab of Dr. Elaine Ingham. Bath inoculates their biochar with a blend of bacteria and mycorrhizae, including isolated bacterial stains, worm castings, humic acid, kelp, and molasses. This blending takes the guesswork out of the equation for their customers—since the product is ready to be put into the soil immediately, gardeners do not need to worry about making sure the

biochar is aged or weathered appropriately. In addition to offering biochar for garden use, Bath is using biochar for landscape and turf installation, and developing protocols for applications throughout the region to reduce conventional fertilizer inputs and water consumption, a critical aspect of conservation on the Colorado Front Range.

Bath has several other areas of biochar research. They are working to understand how biochar functions in typical over-the-counter peat- and perlite-based growing media to expand the knowledge, product line, and customer uses for biochar. Based on tests, they believe biochar is an ideal replacement for perlite, which tends to harbor anaerobic bacteria in growing media. Hydroponic growing is another area of interest for their biochar research, whether adding pulverized biochar to the reservoir or utilizing biochar as a hydroponic substrate. Bath is also researching the functions and benefits of biochar in a compost tea environment, whether added to the compost used to make the tea or pulverized in the tea itself, and believes that the many uses for biochar have only begun to be realized.

Bath is extremely excited to be part of the growing biochar community. Says Spencer Bath, "Informing the public about the incredible benefits of biochar and organic practice, as well as analyzing how biochar functions to alter our typically alkaline clay native soil in Northern Colorado is a priority for our business."

For more information, please see <http://www.bathgardencenter.com> or contact James McManaman, R&D Project Director at 970-484-5022.

Biochar Briefs: News Roundup for April

We update the website daily with new articles on biochar. For more information, please see: <http://www.biochar-international.org/newsbriefs>.

Australia

<http://eponline.com/articles/2012/04/02/global-research-partnerships-key-to-new-sustainable-solutions-across-industries.aspx>

Alcoa Foundation is supporting Biochar and Energy from Trees – Conducted by Greening Australia, The University of Adelaide, CSIRO Ecosystem Services and other partners, aiming to re-vegetate one of Australia's 15 biodiversity hotspots and leverage new energy-generation opportunities provided by emerging carbon markets.

Canada

<http://www.calgaryherald.com/business/Ground3+putting+nature+back+into+urban+landscape/6363959/story.html>

Landscape architecture company, Ground3, is using biochar to rehabilitate a 78-acre brown field site in Calgary and turn it into natural wildlands. The site will house a bio-energy pilot project to convert vegetation to charcoal that can then be spread over the soil.

Germany

<http://www.mz-web.de/servlet/ContentServer?pagename=ksta/page&atype=ksArtikel&aid=1334258318383>

Bokashi and biochar are a productive combination for backyard greenhouse gardening in Germany that has been developed into a profitable business.

<http://womblog.de/kolumbien-biologische-vielfalt-als-chance-fr-nachhaltige-landnutzung>

The Las Gaviotas project in Colombia has restored thousands of acres of desert to rainforest and productive agriculture using compost and tree planting. Biochar and bokashi are now being added to the restoration tool kit.

United Kingdom

<http://www.guardian.co.uk/environment/green-living-blog/2012/apr/05/gardeners-peat-carbon?newsfeed=true>

Conservationists are sounding the alarm about carbon-intensive peat-mining as a source of garden and potting soil. Biochar is recommended as more sustainable substitute for peat.

United States

http://ultimatewestu.com/stories/345256-rice_university-rice-university-study-improves-recipe-for-soil-additive

A study at Rice University has found that biochar is most effective as a regulator of soil moisture when the production temperature is a minimum of 450 degrees Celsius. Lead researcher Caroline Masiello said that the hydrologic benefits of biochar vary widely with biochar production conditions.

<http://southeastagnet.com/2012/04/03/citrus-industry-addresses-biochar-psyllids-fawn-and-more>
The Citrus Industry looks at the benefits of converting orchard waste to biochar in this podcast.

<http://www.greenbiz.com/blog/2012/03/29/carbon-negative-economy-practical-possibility-or-pipe-dream>

Iowa State's Bioeconomy Institute participated in two-day workshop on biochar as part of the Carbon War Room's Creating Climate Wealth Summit in Washington, D.C. Workshop attendees included the USDA, Conoco, Tenaska Energy, Phycal, Cool Planet Biofuels and Biochar Solutions.

<http://www.rdmag.com/News/Feeds/2012/04/general-sciences-new-care-cornell-partnership-to-fight-global-conce/>

Cornell and the global humanitarian organization CARE have launched a partnership to create solutions for poverty, world hunger and climate change. In Vietnam, a team is adapting pyrolytic cook stoves and using biochar as a soil additive to boost fertility.

<http://nextbigfuture.com/2012/04/progress-for-waste-heat-engine-to-make.html>

Cyclone's Waste Heat Engine is being adapted for use in China by Great Wall Alternative Power Systems Ltd. The company hopes to "deliver viable, low cost biomass-based power solutions integrated with a biochar process that can help remediate water and soil pollution."

http://www.vcreporter.com/cms/story/detail/waste_not_want_not/9738/

Agromin, an organic recycling company in Oxnard, California is developing a soil amendment based on biochar, as a complement to its composting business. Production facilities should be operational within a year.

http://www.laurinburgexchange.com/view/full_story/18282238/article-Young-entrepreneurs-seek-investors?instance=popular

High school sophomore Anna Lisa Ciarrocca won top honors and pledges for investment money to fund her start-up biochar company, Southeastern Biochar. She was inspired to create a biochar business after reading an article about the carbon-negative soil amendment, which she manufactures in a biochar kiln she developed herself.

Abstract Deadline Extended for the 4th International Biochar Conference in Beijing, China, September 2012

The organizing committee of **Biochar: The Road to Richer Food and a Safer Environment**, has extended the abstract acceptance period until May 15th and early registration until June 30th. The event will be held September 16 – 20, 2012 in Beijing China at the



Friendship Hotel (please note that the hotel will fill up quickly and participants are encouraged to secure hotel reservations by May 31st).

Abstracts will be accepted under the following topics: biochar production and characteristics, biochar and plant/food production, biochar and soil physical processes, biochar and soil chemical processes, biochar and soil biological processes, biochar and environmental quality, biochar and climate change, biochar and policy, and a special theme on biochar producing equipment. For more information, including registration dates, sponsors, and other information, please see the conference website at: <http://www.ibi2012.org/En/Welcome.html>.

Opportunities in Biochar

Opportunities in Biochar showcases announcements for the public to apply for funding, jobs, publications, conferences, etc. These announcements are also posted on the IBI website in two places: Biochar Updates and the Member Bulletin Board.

- Submit an Expression of Interest: Organizers for the upcoming International Training Course on Biochar Production, Testing and Utilisation (Nanjing, China) Sept 10 - 15, 2012 are looking for expressions of interest from potential participants. For more information on this opportunity, please see: <http://www.biochar-international.org/node/3239>.
- Submit an abstract for the Biomass Waste Management as a Source of Renewable Energy, Agriculture Sustainable, and Global Warming Mitigation conference; location East Java, Indonesia; **due May 1, 2012**. For more information, please see: <http://www.biochar-international.org/node/3156>.
- Submit an abstract for the 30th International Activated Carbon Conference, Pittsburgh, PA USA October 4 – 5, 2012. For more information, please see: www.pacslabs.com/conferences/iacc.
- Receive a free biochar consultancy/research for your company. If you have a company address in Wales, Bangor University is offering free biochar consultancy and research under the European Union SEREN program. For more information, please see: <http://www.biochar-international.org/node/3233>.

New job opportunities and PhD postings are updated at: <http://www.biochar-international.org/network/jobs>

Upcoming Calendar Events

- April 22 – 27, 2012: Biochar for Soil Remediation and Global Warming Mitigation at European Geosciences Union General Assembly 2012; location Vienna, Austria; more information: <http://www.biochar-international.org/node/2903>.
- May 5, 2012: Florida Biochar Group Meeting; location Melbourne, FL (USA); more information: <http://www.biochar-international.org/groups/Florida>.
- May 24 – 25, 2012: Biochar: The soil is the limit!; location Wageningen, the Netherlands; more information: <http://www.biochar-international.org/node/3274>.

- June 18 - 22, 2012: 20th European Biomass Conference and Exhibition; location Milan, Italy; more information: <http://www.biochar-international.org/node/2952>.
- June 26 – 27, 2012: Biomass Waste Management as a Source of Renewable Energy, Agriculture Sustainable, and Global Warming Mitigation; location East Java, Indonesia; more information: <http://www.biochar-international.org/node/3156>.
- July 2 – 6: Biochar Symposium at the EuroSoil 2012 Conference; location Bari, Italy; more information: <http://www.biochar-international.org/node/2622>.
- July 3 – 5: International Symposium on Reclamation, Restoration & Rehabilitation Towards a Greener Asia; location Kuala Lumpur, Malaysia; more information: <http://www.biochar-international.org/node/3091>.
- July 29 – August 1: United States Biochar Conference; location Sonoma, CA, United States; more information and registration: <http://2012.biochar.us.com>.

See the [IBI Calendar page](#) for more events. To add an event to the calendar, send the information to info@biochar-international.org.

Regional Biochar Group Updates

To read more on the 43 regional and national biochar groups, [please see IBI's website](#). This month includes updates from the Korea Biochar Research Center (KBRC) and the Florida Biochar Initiative (United States).

Korea Biochar Research Center (KBRC), South Korea

The KBRC very successfully organized its 1st International Symposium on Biochar December 8 – 9, 2011 and the detailed information is now available at their updated website (link to: <http://www.biochar.co.kr>). The symposium's theme was Biochar for Climate Change Mitigation & Soil and Environmental Management and had delegates from 13 countries presenting their work on biochar and sharing ideas. The updated website also has photos from the event. KBRC is now looking at a follow on 2nd International Symposium on Biochar in Korea.

Additionally, KBRC is working with a new group in Korea, the Korea Biochar Association. For more information, please see: <http://www.biochar.co.kr>.

Florida Biochar Initiative (United States)

The Florida Biochar Initiative will meet on Saturday, May 5th at John Roger's site in Melbourne, Fla. at 11 am. Mr. Rogers will demonstrate a complete process from dry biomass to finished biochar. Wae Nelson will demonstrate a smaller kiln version as well. Mike Davis will have samples of biochar mixed with compost and aged in burlap bags. For more information on this meeting, please see: <http://www.biochar-international.org/groups/Florida>.

Recently Published Biochar Research

IBI tracks all published research on biochar and includes it in our [online bibliography](#). The following articles were added in the last month. Please visit the website bibliography for more information on any of these articles. Due to copyright, we cannot provide full copies of articles unless we have permission from the publisher. If you have published work that is not included, [please email us](#).

Åslund, Ida (2012). Effects of applying biochar to soils from Embu, Kenya – Effects on crop residue decomposition and soil fertility under varying soil moisture levels. Thesis for Department of Soil and Environment, Uppsala, Sweden.

Carrier, Marion, Ailsa G. Hardie, Ümit Uras, Johann Görgens, Johannes (Hansie) Knoetz (2012). Production of char from vacuum pyrolysis of South-African sugar cane bagasse and its characterization as activated carbon and biochar. *Journal of Analytical and Applied Pyrolysis*.

Enders, Akio, and Lehmann Johannes (2012). Comparison of Wet-Digestion and Dry-Ashing Methods for Total Elemental Analysis of Biochar. *Communications in Soil Science and Plant Analysis*, Volume 43, Number 7, p.1042-1052.

Garcia-Perez M., J.A. Garcia-Nunez, T. Lewis, C. E. Kruger, S. Kantor (2011). Methods for Producing Biochar and Advanced Bio-fuels in Washington State. Part 3: Literature Review of Technologies for Product Collection and Refining. Third Project Report. Department of Biological Systems Engineering and the Center for Sustaining Agriculture and Natural Resources, Washington State University, Pullman, WA, 129 pp.
<http://www.che.wsu.edu/~suha/ChE481/Lectures-2012/Report-three.pdf>.

Kaal, Joeri, Cortizas Antonio Martínez, Reyes Otilia, and Soliño Mario (2012). Molecular characterization of *Ulex europaeus* biochar obtained from laboratory heat treatment experiments – A pyrolysis–GC/MS study. *Journal of Analytical and Applied Pyrolysis*.

Nigussie, Abebe, Kissi Endalkachew, Misganaw Mastawesha, and Ambaw Gebermedihin (2012). Effect of Biochar Application on Soil Properties and Nutrient Uptake of Lettuces (*Lactuca sativa*) Grown in Chromium Polluted Soils. *American-Eurasian J. Agric. & Environ. Sci.*, Volume 12, Number 3, p.369-376.

Oh, Taek-Keun, Bongsu Choi, Yoshiyuki Shinogi and Jiro Chikushi (2012). Effect of pH Conditions on Actual and Apparent Fluoride Adsorption by Biochar in Aqueous Phase. *Water, Air, & Soil Pollution*.

Ormsby, Rick, Kastner James R., and Miller Joby (2012). Hemicellulose hydrolysis using solid acid catalysts generated from biochar. *Catalysis Today*.

Pasquale, Claudio De, Marsala Valentina, Berns Anne E., Valagussa Massimo, Pozzi Alessandro, Alonzo Giuseppe, and Conte Pellegrino (2012). Fast field cycling NMR relaxometry characterization of biochars obtained from an industrial thermochemical process. *J Soils Sediments*.

Peng Fu, Song Hu, Jun Xiang, Weiming Yi, Xueyuan Bai, Lushi Sun, Sheng Su (2012). Evolution of char structure during steam gasification of the chars produced from rapid pyrolysis of rice husk. *Bioresource Technology*.

Rezende, Edivaltrys I. P., Angelo Lilian C., dos Santos Sailer S., and Mangrich Antonio S. (2011). Biochar & Carbon Sequestration [Biocarvão (Biochar) e Sequestro de Carbono]. *Revista Virtual de Química*, Volume 3, Number 5, p.426-433.

Schulz, Hardy, and Glaser Bruno (2012). Effects of biochar compared to organic and inorganic fertilizers on soil quality and plant growth in a greenhouse experiment. *Journal of Plant Nutrition and Soil Science*.

Senoo, Kazunari, Kosaki Yasunori, Ogawa Makoto, and Ishikawa Munetaka (2012). Carbon Sink Evaluation for Biochar Production Process. *Design for Innovative Value Towards a Sustainable Society*. p.724-729.

Song, Yang, Wang Fang, Bian Yongrong, Kengara Fredrick Orori, Jia Mingyun, Xie Zubin, and Jiang Xin (2012). Bioavailability assessment of hexachlorobenzene in soil as affected by wheat straw biochar. *Journal of Hazardous Materials*.

Sopeña, Fatima, Semples Kirk, Sohi Saran, and Bending Gary (2012). Assessing the chemical and biological accessibility of the herbicide isoproturon in soil amended with biochar. *Chemosphere*.

Southavong S, Preston T R and Man N V (2012). Effect of biochar and charcoal with staggered application of biodigester effluent on growth of water spinach (*Ipomoea aquatica*). *Livestock Research for Rural Development*. Volume 24, Article #39.
<http://www.lrrd.org/lrrd24/2/24039.htm>

Southavong S, Preston T R and Man N V (2012). Effect of soil amender (biochar or charcoal) and biodigester effluent on growth of water spinach (*Ipomoea aquatica*). *Livestock Research for Rural Development*. Volume 24, Article #26. <http://www.lrrd.org/lrrd24/2/24026.htm>

Widowati, W., Utomo H., Guritno B., and Soehono L. A. (2012). The Effect of Biochar on the Growth and N Fertilizer Requirement of Maize (*Zea mays L.*) in Green House Experiment. *Journal of Agricultural Science*, Volume 4, Number 5.
<http://ccsenet.org/journal/index.php/jas/article/view/16140/10929>

Xu, Xiaoyun, Cao Xinde, Zhao Ling, Wang Hailong, Yu Hongran, and Gao Bin (2012). Removal of Cu, Zn, and Cd from aqueous solutions by the dairy manure-derived biochar. *Environmental Science and Pollution Research*.