



August 2011 News from the International Biochar Initiative

31 August 2011

IBI Biochar Standards Update: Experts Workshop in Frankfurt

Since September 2010, IBI has been engaged in a global, transparent process for creating a Biochar Product Definition and Standard. IBI completed the first phase of this standard-setting process in July, 2011 with a workshop of biochar experts in Frankfurt, Germany. This phase of IBI's standard setting process is built on earlier work initiated by the IBI Advisory Committee, and is modeled on the standard setting processes developed by large standard setting organizations like the International Standards Organization (ISO). IBI's goal is to establish an IBI certification process for biochar materials to enable market development of biochar. The IBI standards and testing protocols may also be used as the basis for any governmental and third-party certification scheme. We are now beginning Phase 2 of the standard-setting process, which is targeted for completion by the end of 2011 with the publication of the standard. IBI will then begin the certification process.

The workshop in Frankfurt allowed a small group of experts to review and consolidate the draft standards document that was created by two stakeholder working groups (operating in two hemispheres to overcome time zone constraints) over a six month period in an open, public process where all interim drafts were posted for public comment and input. Keith Driver and Alison Lennie of Leading Carbon, consultants who are leading the current process for IBI, convened the experts workshop with help from Kelpie Wilson, IBI Project Development Director, on July 26-27. To read the remainder of this story, please see: www.biochar-international.org/characterizationstandard#august_2011.

New IBI Business Member: Brooks Pierce

Brooks Pierce is a business law firm with a robust Sustainability Practice located in North Carolina, US whose sustainability lawyers work with clients to solve

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complex natural resource problems in collaborative ways. They look forward to continuing to serve as legal counsel to organizations involved with biochar research, technology, and production. For more information, see: www.brookspierce.com.

All IBI Business Members can be found on our website at: <http://www.biochar-international.org/IBI-business-members>. If your organization is interested in a business membership, please contact Kelpie Wilson at kelpie@biochar-international.org for more information.

IBI continues to grow. We welcome our new members.

Profile: re:char—Creating Affordable Opportunities for Biochar Production and use in Western Kenya

Jason Aramburu started working on biochar as a research scientist in 2005, through Princeton's Climate Mitigation Initiative and the Smithsonian Tropical Research Institute and in 2008 formed re:char. His initial intention was to develop fast and slow pyrolysis systems for farms in the US, however after he connected with an organization in Western Kenya, Aramburu saw a real need for biochar and a great potential for rapid scale-up. re:char now focuses its work to empower subsistence farmers in the developing world to enhance their crop yields and supplement their income through biochar production and use (which can also improve soils and sequester carbon). The organization has raised over \$370,000 to date to support this work. Specific funders include the Hitachi Foundation, Echoing Green, the Dutch Postcode Lottery, and DOEN Foundation.



With small farmers in Western Kenya spending more than half of their annual income on fertilizers, they are interested in new means to improve their soils. Not only are the fertilizers detrimental to the environment and to household economics, but the ammonia in these fertilizers can lead to acidification and thinning of agricultural soils over time. To reach out to local farmers, re:char is partnering with Salim Mayeki Shaban and his organization ACON, a farmer's association in Western Kenya, located in the Bungoma area. ACON had been experimenting with biochar additions to farmland with positive results, but was looking for a way to produce sizable amounts of biochar on site using crop waste (mainly sugarcane). They were also interested in an affordable kiln which farmers could purchase to produce their own supply of biochar for their fields.

To read the remainder of this story, please see: <http://www.biochar-international.org/rechar>

Photo: Adding biochar to soils; courtesy of re:char.

Terra Preta Closes the Loop in Germany

By Kelpie Wilson, IBI Project Development Director

It is no great surprise that Germany, a country that is leading the world in renewable energy generation, would have a strong community of biochar researchers and practitioners. Not wanting to miss out on an opportunity to see some cutting-edge biochar work, I made sure to arrive a day early for the IBI Biochar Characterization Standards meeting in Frankfurt Germany. Development specialist and Frankfurt area resident Christa Roth (author of the GIZ Micro-Gasification Manual) kindly agreed to help me set up visits and drive me to see ongoing biochar research at the University of Giessen and the Palaterra biochar compost facility at Hengstbacherhof.



BIOCHAR DIVERSITY

We met researcher Claudia Kammann at her lab at the Department of Plant Ecology, University of Giessen, 60 km north of Frankfurt. Dr. Kammann has worked on characterizing a variety of biochars and hydrochars (hydrochars are produced by hydrothermal carbonization). Some of her recent publications have looked at biochar's role in drought tolerance and metal uptake by plants in sandy soils, and she is now developing a set of simple, cheap and easy biotoxicity tests (variations of worm avoidance tests and plant germination tests) that will accurately identify toxic substances in a charred material.

To read the remainder of this story, please see: http://www.biochar-international.org/Closing_the_loop_in_Germany

Photo: Joachim Böttcher, Palaterra co-founder, in his biochar garden, pointing to the bins where he first combined biochar and waste to make his "Neue Terra Preta"; courtesy of Kelpie Wilson.

Gaining Theoretical and Practical Experience with TLUDs at Stove Camp

By Thayer Tomlinson, IBI Communications Director

I had the pleasure of joining about 25 other participants to learn how to design, build, and operate small gasifiers at the CHAB camp (Combined Heat and Biochar) August 7 – 12th. Run by the [Biomass Energy Foundation \(BEF\)](#), the camp was located at the [New England Small Farm Institute \(NESFI\)](#) in Belchertown MA (United States). With large indoor and outdoor facilities and tools, it was a perfect place to test and build gasifiers.



The camp's three instructors Paul Anderson (Dr. TLUD), Hugh McLaughlin, and Tom Reed provided group lectures on gasification, thermodynamics, design, application, feedstock issues, and chemistry as well as hands on instruction. We examined existing rocket and TLUD (top lit updraft) stove models, learned about larger "ovens"—55 gallon TLUDs—and had the opportunity to put theories into practice by building our own gasifiers and testing them. Through lighting and operating the units, it became obvious which designs worked and which needed further revision. Participants also put our stoves to work by cooking meals and learned how the stoves behave "in the field" when rain and wind are very much present. We also had the ability to use multiple feedstocks such as switchgrass, woodchips, walnut shells, jatropha seeds, and pellets—with different moisture percentages.

Firing up the stoves highlighted some of the common stove testing procedures such as the water boiling test (which really clarified how long 40 minutes can be if you are waiting for water to boil).

For the remainder of this story, please see: http://www.biochar-international.org/CHAB_Camp_August_2011

Photo: Working on stove designs; courtesy of Thayer Tomlinson

Biochar Gets Started in Hampton Roads, United States

Hampton Roads, at the mouth of the Chesapeake Bay, United States, is an ideal place to reap the environmental benefits of biochar. The region has a warm, moist climate that produces abundant biomass, and has urban areas that must deal with solid waste. The region's soils have been farmed intensively for five hundred years and now must be fertilized to be productive, but discharge of fertilizer into the Chesapeake has to be carefully monitored. This combination of factors provides limitless opportunities for locally produced and locally used biochar to serve as an inexpensive and sustainable soil amendment that reduces the need for chemical fertilizer.

Hampton Roads is also home to NASA's (the National Aeronautics and Space Administration) Langley Research Center, where atmospheric scientists are on the forefront of measuring and understanding the effects that human activities are having on the planet's climate. This acute awareness of the climate problem led one NASA scientist, Doris Hamill, to promote the use of biochar in the local community.

For the remainder of this story, please see: http://www.biochar-international.org/NASA_Hampton_Roads

Biochar Briefs - News Roundup for August 2011

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

Australia

Biochar producer Pacific Pyrolysis has decided to go for a listing on the Australian Stock Exchange (ASX). PacPyro is seeking to raise \$5 million in an issue to shareholders. The company expects to deploy its first commercial scale plants beginning in 2012.

Australian biochar company BiG (Black is Green) has begun a joint venture with Mara Seeds to run field trials for biochar made from various feedstocks in order to establish cost structures and markets for biochar.

Brazil

Nanotechnology will help a group of scientific experts on Terra Preta at the Brazilian National Institute for Amazon Research (INPA) identify how carbon works to maintain soil fertility. The research will be in partnership with the Federal University of Minas Gerais and the field studies will take place at the Terra Preta research site at the Costa do Laranjal near Manaus under the direction of Newton Falcon.

Brazilian agriculture agency Embrapa is working with 14 research institutions and universities in Brazil and abroad to characterize Terra Preta soils at the Embrapa field station in the town of Iranduba in Western Amazon. IBI member Siu Mui Tsai participates in the work as a researcher with the Nuclear Energy Center for Agriculture (CENA/USP) studying the action of soil microbes.

Canada

Canadian company, Diacarbon Energy Inc. has a chance to win a cash prize to help it move its waste-to-biochar process from the research phase to commercialization. It has made the top 25 cut of the BCIT-New Ventures Competition and is in the running for a share of \$360,000 in prize money.

Canadian company Nova Green Inc. has received investment funds from Sustainable Development Technology Canada's SD Tech Fund to demonstrate its integrated process to

extract the inulin and xylitol from Jart (Jerusalem artichoke) while processing the residual biomass into a biochar for use as a soil enhancer and to sequester carbon.

Germany

Biochar researcher Bruno Glaser has established the first terra-preta field trial under practical conditions in Central Europe at the farm of Herbert Mietke in East Brandenburg, Germany. Glaser reports that after the first two years of trials, soil water retention and farm income were both increased.

Biochar is an option being considered for disposal of the 3 tons of dog waste generated every day in Leipzig, Germany. Researcher Monika Kruger recommends biochar over biogas digesters because biochar will kill all potential pathogens while still retaining much of the nutrient value in the dog waste.

United States

IBI members Jim Grob, Art Donnelly, Gloria Flora and Thomas Miles responded to criticism of biochar by the editor of the compost industry journal BioCycle in a guest editorial. "To realize its full potential as a tool for carbon cycle management and to sustainably increase soil productivity, biochar should be tested in combination with other organic waste streams," say the authors.

The USDA Natural Resources Conservation Service has awarded a \$12,000 Conservation Innovation Grant to David McDaniel of Earth Dharma Farm in Maine, USA. McDaniel will demonstrate an on-farm biochar system using alder coppice wood as feedstock and a solar kiln to pre-dry the wood.

From Superfund site to native grassland? US EPA is meeting with stakeholders in Colorado, USA to discuss ways to deal with increasing water pollution from old mine sites. The Mountain Studies Institute offers a potential solution with biochar. Test plots using biochar have successfully re-vegetated old mine sites.

US soldiers learned how to make and use biochar to improve a sandy soil at the North Carolina Farm Center for Innovation and Sustainability. IBI member Richard Perritt taught the biochar techniques to about 45 Army Reservists from nearby Fort Bragg who may eventually take what they have learned and apply it in Iraq, Afghanistan or Africa.

The Rodale Institute is starting biochar field trials. Beginning in June, 2011 and continuing for the next five years, Washington & Jefferson College and the Rodale Institute will conduct trials on the Rodale Institute's Kutztown farm. Results of the first crop harvest will be reported this winter at www.rodaleinstitute.org.

The US Government Accountability Office has released a new report on climate engineering. Biochar was one of several carbon sequestration techniques studied.

Annals of Environmental Science (AES) Accepting Biochar Paper Submissions

A recent report shows the most downloaded paper in the free online peer-reviewed open access journal Annals of Environmental Science is "*Characterization of a Designer Biochar Produced at Different Temperatures and Their Effects on a Loamy Sand*" by Jeff Novak and colleagues, Annal. Environ. Sci. 2009, 3: 195-206 which has been accessed 903 times since posting. The report also highlighted that four of the top five papers in AES are biochar-related. The AES section on Biochar Research and Applications is now accepting submissions for papers; AES peer-reviews and publishes contributions on an open basis and is currently at Volume 5 at www.aes.northeastern.edu.

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 abstract for conference: The Biochar Symposium at the EuroSoil 2012 Conference (Bari, Italy): will be held July 2 – 6, 2012. **Abstract deadline is Oct. 10, 2011.** More information is available at:
<http://www.biochar-international.org/node/2623>.

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

Upcoming Calendar Events

August 28 – September 1: 242nd ACS National Meeting and Exhibition (featuring session: Black Carbon and Biochar for Soil Fertility and Carbon Sequestration); Location Denver, CO, United States; more information <http://portal.acs.org>.

August 30 – September 1: Farm Progress 2011; Location Decatur IL, United States; more information <http://www.farmprogressshow.com/main.aspx>.

September 7 – 9: Global Soil Partnership (GSP) for Food Security and Climate Change Adaptation and Mitigation Launch; Location Rome, Italy; more information <http://www.biochar-international.org/node/2470>.

September 15 – 18: 2nd Asia-Pacific Biochar Conference (APBC2011); Location Kyoto, Japan. Register now; more information (and registration): <http://apbc2011.com>.

September 20 – 23: Biochar and New Green Agriculture in China; Location Nanjing, China; more information <http://www.biochar-international.org/node/2568>

September 26 – 27: European Biochar Symposium 201; Location Halle/Saale, Germany; more information <http://www.biochar-international.org/node/2468>

September 26 – 30: Stove and CHAB Camp (Combined Heat and Biochar); Location Zamorano University, Honduras; more information: <http://www.biochar-international.org/node/2205>

October 10 - 15: Biochar Research, Development and Application International Symposium; Location: Nanjing, China; more information: <http://www.biochar-international.org/node/2761>

October 11 – 13: Northeast Biomass Conference & Trade Show; Location Pittsburgh, PA, United States; more information: www.biomassconference.com/northeast

October 18 - 19: Washington Future Energy Conference; Location Seattle, WA, United States; more information: <http://www.futureenergyconference.com/cities/seattle/>

October 18 – 19: Restoring the West Conference; Utah State University, Logan, UT, United States; more information: <http://www.restoringthewest.org/>

October 24 – 26: Carbon in a Changing World; Location Rome, Italy; more information: <http://www.biochar-international.org/node/2748>

November 9 – 10: Nordic Biochar Seminar; Location Oslo, Norway; more information: <http://www.biochar-international.org/node/2769>

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 regional and national biochar groups, please see IBI's website at: www.biochar-international.org/network/communities. This month features updates from the South East Asia Biochar Interest Group; specifically in Singapore and Malaysia and Warren Biochar (Australia).

South East Asia Biochar Interest Group

The group is tracking all biochar-related activities and research in the region through a new database. To access the BIG-SEA Activity Database, please see: <http://www.biochar-international.org/regionalgroups/southeastasia>.

Biochar Activities in Singapore

Research interest from a number of groups in Singapore and Malaysia has led to an order being placed with BlackEarth in Australia for a 20 ft container of biochar. The importation work is being led by Uniseal in Singapore, who are planning to undertake green-roof and other trials on biochar. Biochar Systems Ltd (BSL) undertook the initial coordination for this initiative which also includes the research arm of the Singapore Parks Department (CUGE) and Universiti Malaysia Sabah (UMS).

Biochar Activities in Malaysia

Two Cambodian students, Bona Moung and Piseth Yu, have completed their 5 month placement with Universiti Kuala Lumpur MICET, and are set to return home to Phnom Penh to continue their studies with the Royal University of Agriculture. The students investigated the heat transfer efficiency, specific emissions and biochar yield from pellets and coconut shells using Paul Anderson's TLUD, Crispin Pendecott's VESTO, a traditional Malaysian clay stove and the three stone fire.

Faculties and students at the Universiti Putra Malaysia, Serdang, are actively conducting research on biochar, focusing on pyrolysis methods for different feedstocks and experiments in the greenhouse and field on the application of the biochars (oil palm empty fruit bunch biochar and rice husk biochar) for cultivation of vegetable and field crop (maize and rice).

The Malaysia Palm Oil Board is continuing work on the Biochar Experimenter's Kit (BEK) research program. They completed construction of a new facility for the BEK. A few batches of the feedstock have been run through since then, and some minor modification on the BEK are needed to optimize performance.

To see more information on these activities, please see: <http://www.biochar-international.org/regionalgroups/southeastasia>.

Warren Biochar (Australia)

The Warren Biochar group is interested in setting up biochar trials in a number of agricultural applications in the Manjimup region's high rainfall, heavy loam environment following a presentation by Prof Syd Shea of Rainbow Bee Eater Pty Ltd. The group is currently refining its purpose and procedure for each experiment and undertaking further research before commencing investigations. For more information, please see: <http://www.biochar-international.org/warren>.

Recently Published Biochar Research

IBI tracks all published research on biochar and includes it in our online bibliography: www.biochar-international.org/biblio. 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 at: info@biochar-international.org.

Anderson, Craig Robert, Condrón Leo M., Clough Tim J., Fiers Mark, Stewart Alison, Hill Robert A., and Sherlock Robert R. (2011). Biochar induced soil microbial community change: Implications for biogeochemical cycling of carbon, nitrogen and phosphorus. *Pedobiologia*, 07/2011.

Chen, Baoliang, Chen Zaiming, and Lv Shaofang (2011). A novel magnetic biochar efficiently sorbs organic pollutants and phosphate. *Bioresource Technology*, Volume 102, p.716–723.

K., Coumaravel, Santhi R., Sanjiv Kumar V., and M.M. Mansour (2011). Biochar – A Promising Soil Additive-A Review. *Agricultural Reviews*, Volume 32, Number 2.

Cowie, Annette, editor (2011). *Rural Climate Change Solutions Symposium*; May 3 - 4, 2011, published 08/2011, University of New England.

Cui, Hao-Jie, Wang Ming Kuang, Fu Ming-Lai, and Ci En (2011). Enhancing phosphorus availability in phosphorus-fertilized zones by reducing phosphate adsorbed on ferrihydrite using rice straw-derived biochar. *Journal of Soils and Sediments*, 08/2011, Volume Soils, Sec 1: Soil Organic Matter Dynamics and Nutrient Cycling.

Karakoyun, Necdet, Kubilay Senol, Aktas Nahit, Turhan Omer, Kasimoglu Murat, Yilmaz Selahattin, and Sahinere Nurettin (2011). Hydrogel–Biochar composites for effective organic contaminant removal from aqueous media. *Desalination*, 08/2011.

Park, Jin Hee, Choppala Girish Kumar, Bolan Nanthi Sirangie, Chung Jae Woo, and Chuasavathi Thammared (2011). Biochar reduces the bioavailability and phytotoxicity of heavy metals. *Plant and Soil*, 08/2011.

Prendergast-Miller, Miranda T., Duvall Michael, and Sohi Saran P. (2011). Localisation of nitrate in the rhizosphere of biochar-amended soils. *Soil Biology and Biochemistry*, 08/2011.

Streubel, Jason Dale (2011). Biochar: Its characterization and utility for recovering phosphorus from anaerobic digested dairy effluent. 08/2011, p.159.

Trakal, L., Komárek M., Száková J., Zemanová V., and Tlustoš P. (2011). Biochar application to metal-contaminated soil: Evaluating of Cd, Cu, Pb and Zn sorption behavior using single- and multi-element sorption experiment. 08/2011.

Waters, David, Zwieten Lukas Van, Singh Bhupinder Pal, Downie Adriana, Cowie Annette L., and Lehmann Johannes (2011). Biochar in Soil for Climate Change Mitigation and Adaptation. *Soil Health and Climate Change*, Volume Soil Biology, Volume 29, p.345-368.

Weiming, Zhang, and Wenfu Chen (2011). Application Effect of Biochar on Rice. *New Technology of Agricultural Engineering (ICAE)*, 07/2011.

Zavalloni, Costanza, Alberti Giorgio, Biasiol Stefano, Vedove Gemini Delle, Fornasier Flavio, Liu Jie, and Peressotti Alessandro (2011). Microbial mineralization of biochar and wheat straw mixture in soil: A short-term study; *Applied Soil Ecology*, 08/2011.