February 2011 News from the International Biochar Initiative

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Looking Forward to 2015: IBI 2010 Board Releases a Vision Document

Based on a September 2010 facilitated board retreat focusing on organizational effectiveness and the development of a new strategic plan, the 2010 IBI Board drafted a vision document to guide its work from now through 2015. The professionally-facilitated retreat was funded by the David and Lucile Packard Foundation. In preparation, the facilitators undertook a series of interviews with IBI staff, Board members, and a sample of members from the IBI community to glean information on the organization, its stated and perceived roles and impacts in the biochar community, and future directions. Based on this, the facilitators developed a retreat agenda to help determine a future direction on which to develop a strategic plan. The Board chose a 5-year horizon as the timeframe for describing this future, and from that, a strategic plan is being developed. The vision document is that description of the future.

The resulting vision document highlights routes to achieving successful outcomes by 2015 and asks questions of what is success, how do we get there, and what is IBI's role in achieving that success? It focuses on research (science and technology), policy, and projects.

The full document is available on the IBI website at:
http://www.biochar-international.org/projects.

We welcome your comments or questions about this document. Please contact Shiva Scotti, IBI Administrative Director, at shiva@biochar-international.org.

Biochar Standards Update

IBI's effort to create globally-developed and accepted standards for biochar characterization, production and utilization is in the midst of another round of working group discussions. The working groups have been getting valuable feedback from the larger biochar community and they are working now to determine appropriate test methodologies and threshold reporting levels for physical biochar properties and for potential toxins. The working groups will next focus on comparisons between existing classification and testing schemes for soil amendments to determine whether "allowable levels" of toxins in compost and other types of soil amendments can be utilized or adapted for use in determining the allowable levels of similar compounds in biochar for use as a soil amendment.

The end product of this effort will be establishment of biochar standards that have been developed in a global, transparent, scientifically-based process. The goal in this particular

phase of the work is to produce a universally developed "final product" that any of the IBI members or member organizations can utilize as a basis for governmental and third-party certification agencies to develop biochar standards, apart from any use IBI makes of these products. The second version of the standards draft and all other updates are available at: http://www.biochar-international.org/characterizationstandard.

Project Profile: The first brand of biochar-based fertilizer enters the Chinese market

China is the world leader in chemical fertilizer production, consumption, and imports. Statistical data from the China Agriculture Year Book shows that fertilizer consumption increased from 12.7 million tons in 1980 to 50 million tons in 2010, with an average increase of 1.2 million tons annually. The pollution from fertilizer run-off continues to put pressure on drinking water, and aquatic and atmospheric ecosystems, which inevitably results in further soil and environmental deterioration. Thus, China is looking to find ways to reduce chemical fertilizer consumption and at the same time, increase its utilization efficiency.

Here is where biochar fits into the mix. China has a long history of utilizing charcoal in soils—recently, scientists found charcoal in 4000 year old soils—and charcoal buried in the soil still plays a very important role in maintaining soil fertility. Since 2004, the research group at the China National Research Center of Bamboo (CNRCB) has conducted different studies to explore the role of biochar in restoring deteriorated soils, improving soil cation exchange capacity (CEC), and reducing the amount of required chemical fertilization. The team at the CRNCB realized that putting biochar in soils can be one of the solutions for reducing chemicals in soils and chemical run-off from fertilizers. Therefore, they looked into creating a biochar-based fertilizer and bringing it to market.

To read the remainder of this article, please see: http://www.biochar-international.org/profiles/china.

Photo: Biochar-based amino acid fertilizer; courtesy of Prof. Dr. Zheke Zhong/Mr. Robert Flanagan

Biochar Briefs - News Roundup for February 2011

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

With a $274,000 grant from the South Australia state government, Clean Carbon Capture will complete a feasibility study during the next 12-months on a pyrolysis plant to produce energy and biochar.

The Climate Trust (based in Portland, Oregon, USA) has produced a fact sheet on their report for the West Coast Regional Carbon Sequestration Partnership assessing carbon market investment criteria for biochar projects.

A new UN FAO (Food and Agriculture Organization) study, "Making Integrated Food-Energy Systems (IFES) Work for People and Climate - An Overview", draws on specific examples from

Africa, Asia and Latin America as well as from some developed countries to show how constraints to successfully integrating production of food and energy crops can be overcome. It highlights that producing food and energy side-by-side may offer one of the best formulas for boosting countries' food and energy security while simultaneously reducing poverty. Biochar is included in this report as a component of a sustainable energy/soil system to both condition the soil and help sequester carbon. Also included is mention of WorldStove's Lucia Stove for developing country applications.

Biochar researchers in New South Wales, Australia, have expanded their research to around 350 sites on the North Coast, including coffee, macadamia, and sugar cane farms. Biochar researcher Dr Lukas Van Zwieten has also been involved in researching 34 sites along the Murray River where they have discovered 1600-year-old black soils created by Aboriginal people.

TEDxBerkeley, an offshoot of the popular TED (Technology Entertainment and Design) lecture series, drew more than 1,200 people on February 19th to hear innovative ideas on the theme of "engaging the world." Sustainability advocate Lopa Brunjes spoke about biochar.

Resources for Buying / Selling Biochar

As more biochar enters the marketplace and the demand for biochar grows, the ability to connect buyers and sellers becomes more important. The Biochar Discussion List website has recently set up a listing of biochar sellers at: http://biochar.bioenergylists.org/materials.

Additionally, IBI is upgrading our website soon and we would like to add an Online Biochar Marketplace Directory. Please help us gauge the usefulness of this new feature by answering a very short online survey of five questions that asks about your interest in buying or selling the following:

--Bagged consumer product for gardeners and small farmers
--Bulk biochar for use on farms or for landscape reclamation
--Fully characterized biochar for scientific research
--Manufactured biochar production equipment
--Engineering design services for biochar production
--Consulting services - business and finance
--Consulting services - agronomic use of biochar
--Biochar characterization and testing services

You will find the online survey here. Please feel free to pass the link on to others.

Report on the 2011 ETHOS Stoves Conference

By: Kelpie Wilson

For the third year, IBI attended the annual conference sponsored by ETHOS (http://www.vrac.iastate.edu/ethos/index.php) (Engineers in Technical and Humanitarian Opportunities of Service) held in Kirkland, Washington, USA on January 28-30, to learn about new developments in clean cookstoves, including pyrolytic and gasifier stoves that can produce biochar.

The big topic of discussion at ETHOS 2011 was the progress of the Global Alliance for Clean Cookstoves (http://cleancookstoves.org) program announced by the Clinton Global Initiative last September. The goal of the effort is for 100 million homes to adopt clean and efficient stoves and fuels by 2020. The Alliance, managed by the UN Foundation (http://www.unfoundation.org), will provide $100 million over 5 years to promote clean cookstoves by accelerating stove research and development, creating standards, supporting

advocacy and public education, and partnering with manufacturers. The US government has committed to providing $50 million and the US Environmental Protection Agency and the US Department of Energy will be involved in the R&D effort.

Other topics and presenters included Cheryl Weyant of the University of Illinois who reported on results from field testing of stove emissions in Honduras, Nepal, and Uganda; Dr. Paul Anderson who gave an overview of TLUD (Top-Lit Up-Draft) gasifier stoves; Marc-Antoine Pare of Georgia Institute of Technology who presented his work on rice husk gasifiers at Dr. Paul Oliver's ESR Ltd. research lab in Vietnam; and Nathanial Mulcahy of World Stove who gave a technical presentation on his pyrolytic Lucia stove.

For the complete article including more information on each of the presentations, please see: http://www.biochar-international.org/ethos/2011.

Review: Micro-gasification – Cooking with gas from biomass

GIZ, the German international development agency, has released a very useful new handbook on pyrolytic and gasifier stoves compiled by Christa Roth. Roth has a wide range of experience with these stoves, in both research and field settings. The 100-page manual includes excellent explanatory material that will help experts and non-experts alike understand the processes of biomass gasification in a variety of different stove designs. Dr. Paul Anderson, a promoter of biochar-making "TLUD" stoves said, "the first ten pages of this manual are the best expression I have seen yet of basic TLUD principles."

The handbook features a comprehensive catalog of existing stoves that includes information on their biochar-producing capacity. Another module provides technical information on feedstocks and feedstock preparation. IBI was asked to provide background material on biochar, which is found in an appendix. You can download the manual for free from the GIZ (formerly known as GTZ) website. http://www.gtz.de/de/dokumente/giz2011-en-micro-gasification.pdf

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 Publication: The Journal of Environmental Quality is accepting manuscripts for publication consideration as a special biochar collection with a deadline for manuscript submission as 3/31/2011. For more information, please see: http://www.biochar-international.org/node/2240.

Submit Abstract for Conference: The 242nd ACS National Meeting & Exposition will take place in Denver, CO, United States August 28 – Sept. 1 and will include a section on Black carbon and biochar for soil fertility and carbon sequestration. The session has a call for abstracts open with a deadline of March 21, 2011. Please submit your abstracts to http://abstracts.acs.org.

Submit Abstract for Conference: The 2nd Asia Pacific Biochar Conference 2011 in Kyoto, Japan (APBC KYOTO 2011) will be held September 15 – 18, 2011 and is inviting abstracts on the themes of:

- Education and diffusion methods of carbon sequestration by biochar
- The impacts of applying biochar to agriculture and forest soils
- Steps in the commercialization of biochar: lessons from the region

All abstracts must be submitted electronically through the interface on the APBC KYOTO 2011 homepage: http://apbc2011.com; submission period is March 1 to April 15, 2011.

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

Upcoming Calendar Events

March 3: 17th Annual Ecological Landscaping Association (ELA) Conference; Location Springfield, MA, United States; more information http://www.ecolandscaping.org.

March 3: Transforming Agriculture and Environment with Biochar; Location Tacoma, WA, United States; more information: http://kcts9.org/events/transforming-agriculture-and-environment-biochar-tacoma-science-cafe.

March 9 – 11: Humic Science & Technology Conference Fourteen Northeastern University, Boston (US), with special Biochar Research Session; Location Boston, MA, United States; more information: www.hagroup.neu.edu.

March 21 and 22: Biomass to Biochar Symposium; Location Dunrovin Ranch Montana, United States; more information:
http://www.themontanachallenge.net/The%20Mineral%20County%20Challenge/biomass%20to%20biochar.

May 2 – 5: International BIOMASS Conference & Expo; Location St. Louis, Missouri, United States; more information www.biomassconference.com.

June 6 – 10: 19th European Biomass Conference and Exhibition: From Research to Industry and Markets; Location Berlin, Germany; more information
www.conference-biomass.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 regional and national biochar groups, please see IBI's website at: www.biochar-international.org/network/communities. This month features updates from the New Zealand Biochar Research Network (NZBRN), and the Italian Association on Biochar (ICHAR) reporting on the newly formed EuroChar Project.

New Zealand Biochar Research Network (NZBRN)
The New Zealand 2011 Biochar Workshop “Opportunities, Risks and Acceptance” was held February 10 – 11 and had over 56 attendees from New Zealand, Australia and the Cook Islands. The Workshop included a videoconference with the UK Biochar Research Centre, in which Dr. Saran Sohi gave a keynote speech titled “Origins, Activities and Outputs” on the activities at UKBRC. There were two other keynote speakers: Prof. Ralph Sims who gave a talk on “Biochar and the Competing Uses for Biomass”, and Dr. Stephen Joseph who provided an

overview “From Research and Development to Profitable Business”. There were over 35 presentations (both oral and poster) arranged into sessions on (i) Production Technology, (ii) Biochar Economics, (iii) Life-Cycle Assessments, (iv) Biochar and GHG Mitigation, (v) Characterization of Biochars, (vi) Biochar-Soil-Plant Interactions, (vii) Application Case Studies. A demonstration of a 1.2 m^3 capacity pyrolysis unit was carried out by one of the companies attending the workshop. Attendees also visited the lysimeter experiment at the Plant & Food Research facilities.

Photo: Massey’s experimental continuous pyrolyzer (Model BEK, from All Power Labs, USA); courtesy of Marta Camps Arbestain

Italian Association on Biochar (ICHAR)

News from the Seventh Framework Research Programme of the European Commission: The EuroChar Project was launched in Firenze, Italy in January 2011 which was coordinated by the Italian National Research Council (CNR) under the framework of the FoxLab Initiative established together with the Edmund Mach Foundation (San Michele all'Adige, Trento). The project will operate over the next three years, and will investigate carbon sequestration potentials that can be achieved by transforming plant biomass into biochar. Biochar production will be demonstrated using commercially viable thermo-chemical (TC, Advanced Gasification Technologies, Cremona, Italy) or hydrothermal carbonization processes (HTC, CarbonSolutions, Germany) while detailed ISO-accredited whole Life Cycle Assessments will be carried out according to the International Reference Life Cycle Data System (ILCD, Imperial College, London, United Kingdom). Physico-chemical properties of biochar will be analyzed in a series of laboratory studies that will use standardized analytical protocols (Universitè Pierre et Marie Curie, Paris, France and Martin Luther University, Wittenberg Halle, Germany) and a specific phyto-toxicity test will be made using molecular approaches involving a model plant (University of Southampton, United Kingdom). Part of the study will address the short versus long-term stability of biochar using recently produced and aged charcoal samples coming from archaeological sites. Specific investigations will also be made to assess biochar decomposition using CO2-efflux measurements from 13C labeled materials (Università di Udine, Italy). Three large-scale field experiments will finally be made on short-term rotation forestry in Italy (Libera Università di Bolzano), France (Universitè Pierre et Marie Curie, Paris) and the UK (University of Southampton) to analyze “realistic scale” application of biochar. A number of stakeholders will be involved to review the project’s activities under the framework of the EuroChar Stakeholder Committee (ESC) that will be created to meet periodically during annual project meetings. Dissemination activities will be implemented to make the project’s results available to a wider audience and the media. For more information, please see: http://www.biochar-international.org/regional/italy.

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.

Abdullah, Hanisom, and Wu Hongwei (2011). Bioslurry as a Fuel. 4. Preparation of Bioslurry Fuels from Biochar and the Bio-oil-Rich Fractions after Bio-oil/Biodiesel Extraction. Energy Fuels. 02/2011.

Beck, Deborah A., Johnson Gwynn R., and Spolek Graig A. (2011). Amending greenroof soil with biochar to affect runoff water quantity and quality. Environmental Pollution, 02/2011.

Hylander, Lars Daniel, Günther Folke, and Hansson Kurt (2010). Climate saving soils with biochar. NJF seminar 430, Climate Change and Agricultural Production in the Baltic Sea Region, 2010, Uppsala Universitet Teknisk-naturvetenskapliga vetenskapsområdet, Sweden.

Peng, X., Ye L. L., Wang C. H., Zhou H., and Sun B. (2011). Temperature- and duration-dependent rice straw-derived biochar: Characteristics and its effects on soil properties of an Ultisol in southern China. Soil and Tillage Research.

Rostad, Colleen E., and Rutherford David W. (2011). Biochar for Soil Fertility and Natural Carbon Sequestration, USGS FactSheet, 01/2011, Number 2010–3117, Reston, VA, USA.

Taghizadeh-Toosi, Arezoo, Clough Tim J., Condron Leo M., Sherlock Robert R., Anderson Craig R., and Craigie Robin A. (2011). Biochar Incorporation into Pasture Soil Suppresses in situ Nitrous Oxide Emissions from Ruminant Urine Patches. J. Environ. Qual., 01/2011.

Zhang AF, Cui LQ, Pan GX, Li LQ, Hussain Q, Zhang XH, Zheng JW, Crowley D (2010). Effect of biochar amendment on yield and methane and nitrous oxide emissions from a rice paddy from Tai Lake plain, China. Agr Ecosyst Environ 139: 469–475.