August 2010 News from the International Biochar Initiative

2 September 2010

IBI 2010 Less than 2 Weeks Away

The IBI 2010 International Biochar Conference is scheduled for 12-15 September in Rio de Janeiro, Brazil! More information is at www.ibi2010.org. We have posted a draft agenda to download which includes session titles, speakers and presentation titles at: http://www.ibi2010.org/agendaagenda.

Don't forget - IBI is offering a special discount on the registration fee to our members. To take advantage of the discount, you will need to enter your discount code into the registration form. You can register at www.ibi2010.org.

If you are not yet an IBI member: click here to join now. Once you have paid your membership fee, the discount code will be emailed to you

If you are already an IBI member: We emailed discount codes to all IBI members. If you have misplaced that email, let us know and we can resend your discount code.

Biochar 10-10-10 Campaign Update

IBI is joining with the climate action group 350.org to promote a day of climate events on October 10, 2010. It's a Global Work Party to demonstrate climate solutions. Biochar events have already been registered in Australia, Ghana, Hungary, India, Sudan, United States and Vietnam. Don't miss this chance to help boost the global profile of biochar. Please consider hosting an event in your town. It does not have to be a big public event - you can just invite a few friends to join you.

Need ideas for a project? How about **Biochar Landscape Art**? Create a design in biochar and watch it grow! You can use the 350 logo as your design and join thousands of people worldwide who have dramatized the need to return our atmosphere to 350 ppm concentration of CO_2. IBI has a new Technical Bulletin to help you: Using Biochar to Create Artwork in the Landscape. Your biochar artwork will actually store carbon in the soil for hundreds to thousands of years. If you want to try

tree planting with biochar, download IBI's Technical Bulletin, Practical Aspects of Biochar Application to Tree Crops. For more event ideas, visit the IBI Biochar 10-10-10 Campaign page.

IBI is on Facebook

To facilitate sharing ideas and stories about Biochar 10-10-10, IBI has set up a Facebook page. Please come and visit us there. We have also started a photo pool on Flickr to collect all of our Biochar 10-10-10 pictures. And if you Tweet, follow us on Twitter - we are @Biochar_IBI.

Biochar Briefs - News Roundup for August 2010

A number of new biochar studies, ventures and awards were announced in August, including the following:

An important new study on biochar's impact on nitrous oxide emissions, published in the Journal of Environmental Quality, garnered major media coverage from both the scientific and popular press, including an article in Scientific American. The study, led by Bhupinder Pal Singh of Industry & Investment New South Wales Australia and Balwant Singh from the University of Sydney, found that initially biochar produced inconsistent effects in soil, but over time it caused a measurable reduction in nitrous oxide emissions. Bhupinder Pal Singh said, "The impacts of biochars on nitrous oxide emissions from soil are of interest because even small reductions in nitrous oxide emissions can considerably enhance the greenhouse mitigation value of biochar, which is already proven to be a highly stable carbon pool in the soil environment."

A long-awaited study estimating the maximum sustainable technical potential of biochar to mitigate climate was published in August in Nature Communications. The study, led by Dominic Woolf of Swansea University and James Amonette of Pacific Northwest National Laboratory, found that biochar could reduce annual net emissions of carbon dioxide, methane and nitrous oxide by 12% without endangering food security, habitat, or soil conservation. The study was covered in more than 50 news articles from around the world, including Discovery News, New Republic, BBC, New Scientist and Treehugger. Dr. Amonette called biochar "not a panacea" but still "a significant player" in the quest to mitigate greenhouse gas emission. Furthermore, he said, "Using biochar to reduce greenhouse gas emissions at these levels is an ambitious project that requires significant commitments from the general public and government. We will need to change the way we value the carbon in biomass."

The Montana Department of Environmental Quality awarded $350,000 to Algae Aqua Culture to develop a commercial-scale algae greenhouse that will convert waste wood chips into energy and biochar. An anaerobic digester process is planned to produce methane gas, which will be burned, along with wood waste, to provide mechanical power. Biochar from wood waste and waste from the algal processes then will be used to make an organic fertilizer.

Biochar and African Dark Earths is a new project funded by a research grant from ESRC (Economic and Social Research Council). This project investigates the importance of charred carbon in African farmers' management of soil fertility. The project also "seeks to identify the conditions under which biochar can become part of pathways to sustainability that support the livelihood needs and priorities of smallholder farmers - and what governance and policy processes would help." Principal Investigator is Professor James Fairhead at the University of Sussex.

In an interview at Firedoglake, the famed ethnobotanist and local food advocate, Gary Paul Nabham, talks about seed diversity, drought and other food security issues. He also describes his experiments with biochar: "On our land in southern Arizona, we're putting in an orchard of ancient desert fruits. My goal is to first increase the water-holding capacity and nutrient abundance of the soil by using Terra Preta, or biochar."

The forest protection group Mongabay has a lengthy interview with Laurens Rademakers of Biochar Fund about the encouraging results that Congolese villagers are getting with biochar. Rademaker explains how the program has been successful: "Biochar will increase the fertility of problem-soils in a very noticeable, quick and long-term way. This is important for subsistence farmers, because they often cannot afford to buy fertilizers or invest in organic cultivation techniques that take a long time to establish. Biochar can be produced locally, with very low investment, and in a simple, easily understood process."

Practitioner Profile: Landscape Ecology: Creating a Market for Biochar in Hawaii through Field Trials and Public Outreach

When Josiah Hunt graduated from the University of Hawaii at Hilo with a degree in Agroecology and Environmental Quality, he thought about pursuing his career by traveling to remote areas and conducting scientific research. He also realized that a way to make a difference in his community would be to practice sustainable landscaping. While working as a landscaper in 2008, he read a National Geographic article which mentioned biochar. Josiah became immediately obsessed with the idea, but his initial excitement was met with the disappointing reality that there was none locally available for him to use. At that time, Josiah was working with a local mill in exchange for wood to build his home. He noticed the piles of scrap wood, saw an opportunity, and began to make his own biochar to use at home. Two years later, he is making and selling biochar as a full time job with his company Landscape Ecology-making more money than he was while a landscaper.

Click here to read the remainder of the story

Photo: *Biochar test plots at the Hawaii Island Master Garders Association (HIMGA) community garden*

Profile: Rapeseed Bio-Diesel and Rice Husk Charcoal: A model for a recycling society through a partnership between Higashiomi City and KANSAI Corporation, Japan

By Steven McGreevy

Rural areas in Japan are suffering from a variety of setbacks-massive depopulation, severe aging, and economic stagnation to name a few. Small-scale family farmers unable to compete on an increasingly globalized stage are being weeded out, abandoning their farmland, and agricultural communities run the risk of disappearing altogether. Adding to the pain is the threat of environmental pollution and climate change. Faced with these problems, many rural municipalities have initiated rural development projects aimed at revitalizing farming livelihoods,

local culture, and environmental sustainability.

Click here to read the remainder of this story on rapeseed biodiesel and rice husk biochar.

Photo: *bagging rice husk biochar at the production facility; courtesy of Steven McGreevy*.

Biochar Activities in China

One of IBI's board members, David Wayne, recently visited China to tour biochar research projects and meet with some of the biochar practitioners in the country. He found biochar research projects are up and running at several institutions in China, with many others interested in getting involved, as the recent inaugural meeting of the China Biochar Network (CBN) demonstrated. The CBN will host a workshop in Hangzhou October 8 - 10 with participants expected from many parts of China. Visiting speakers include Hal Collins, Saran Sohi, Jim Amonette, Stephen Joseph and Debbie Reed.

The longest-established research projects appear to be those at the Chinese Agricultural University in Beijing, at Zhejiang University in Hangzhou, and at the Institute of Soil Science in Nanjing. Several projects have been aided by grants from the Blue Moon Fund. The intention of the Blue Moon Fund was to assist the early development of biochar research in China, in the expectation that funding for further research and application would be attracted in time from other sources and that the Chinese research projects would quickly be able to contribute findings of international significance.

As a country, China is the largest rice producer with 23% of the world's rice area and 37% of its rice production. Most is grown in irrigated (paddy) fields, so the release of methane by anaerobic bacteria is major issue. A team at Zhejiang University is investigating the ability of biochar made from rice straw to alter the activity of methanogenic bacteria. Experiments are underway both in laboratory jars and under field conditions and the early results are very striking.

Click here to read the remainder of this report

Photo: *Pot trials of rice seedlings in biochar-amended soils at the experimental station of The Institute of Soil Science. From left, Robert Flanagan (Bamboo Research Centre, Hangzhou), Prof. Zubin Xie and the research student, Ms Xu Yanping*; *courtesy of David Wayne*

Report from CHAB (Combined Heat and Biochar) camp 2010

By Christa Roth

About 15 people from the US, Canada and Germany formed the core group of the first CHAB camp attendees, held at New England Small Farm Institute (NESFI) from 9 - 13th August 2010.

Drs Tom B Reed, Paul S Anderson and Hugh McLaughlin guided the participants through the sessions on theory and practice of biochar-creation and the potential applications of heat generated in the process. As form follows function, the principles of wood-gas production and subsequent wood-gas combustion had to be understood first before participants applied the theory hands-on and build char-making devices.

By simple experiments participants learned and experienced that the difference between char-making/tar-burning and tar-making/char-burning is in the air-control. So a major focus was on how to master the art of air-flow regimes and controllably get air to the right places in the right amounts in a CHAB device. Thus the importance of draft was not only discussed, but ventilators and fans for forced convection were built by the participants in various sizes and shapes based on salvaged parts from computers and tin-cans. These were then applied in the two major CHAB application groups: either in retorts, where the focus is more on the char-creation, or in top-lit up-draft (TLUD) devices, where the char is a welcome by-product of a routine process and the focus is to efficiently use the heat and light for cooking, grilling, space heating, lighting etc. Insights were shared on how cultural sensitivities influence the designs of the application, especially in the case of cook-stoves.

NESFI provided an ideal location for all the practical sessions, as people could test the newly created devices immediately. Many meals were cooked on CHAB devices, and many different types of flames were illuminating the scene in the evening hours. The demonstration of a big industrial-sized retort by local experts rounded the experience.

Participants had brought large enough amounts of real-world fuels for trials in existing and new cook-stove applications, so that everybody thrived with the challenge to cleanly burn 'difficult' biomass fuels like whole Jatropha seeds from Tanzania or Cacao shells and rice hulls from Senegal.

CHAB camp 2010 was wonderful learning experience for everybody and definitely repeatable.

Photo: *A combined TLUD/retort made with hand tools from a bucket, used to heat water and make biochar; courtesy of Christa Roth*.

Christa Roth is a freelance consultant for Food and Fuel topics. You can reach her at christa-roth@foodandfuel.info

USDA Issues Call for Applications for REAP Feasibility Grants

On August 6, 2010, the U.S. Department of Agriculture (USDA) announced the opening of the application period for proposals to conduct feasibility studies on prospective renewable energy systems, including anaerobic digesters, under the Rural Energy for America Program (REAP).

Agriculture producers and rural small businesses may apply for a REAP feasibility study grant to help pay for the cost of a comprehensive business-level study that gathers together preliminary data and studies, evaluates the findings, and determines whether the proposed energy project is viable and profitable. The study must be conducted by an independent third party and the grant may not be used to pay for facility design work or permitting/licensing costs.

Assistance is limited to $50,000 or 25 percent of the cost of the study, whichever is less. Approximately $3 million is available to be awarded this year. More details are available in the August 6, 2010 Federal Register.

Application materials may be obtained from your local USDA Rural Development Energy Coordinator or from www.grants.gov (keyword search: REAP). Applications are due on October 5, 2010.

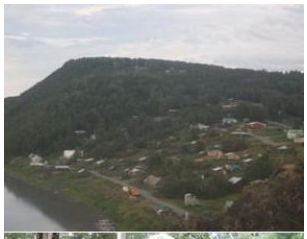
Regional Biochar Group Updates

To read more on regional and national biochar groups, please see IBI's website at: www.biochar-international.org/network/communities. This month includes updates from Biochar Malaysia, Alaska Biochar (United States), and the Pioneer Valley Biochar Initiative (PVBI).

SEA Biochar/Biochar Malaysia

In Malaysia, research work on biochar is just beginning. We started with a workshop in December 2009, i.e. 'Biochar Malaysia Workshop 2009' at Universiti Putra Malaysia. Early this year members of the Faculty of Agriculture, Universiti Putra Malaysia, Serdang, began research projects funded by the Malaysian government on biochar application in agriculture specifically on sandy soils and in vegetable cultivation. A pilot plant set-up by a private environmental engineering company here has successfully produced a biochar from oil palm empty fruit bunches (an agro-waste produced by the palm oil mills) which is called EFB biochar. We are using this biochar for our projects. Otherwise, the only other biochar available is the burnt rice husks which are very low in carbon. The burnt rice husk is increasingly popular in plant nurseries; as a component of their potting mix. However, there is still a lot to be done in Malaysia to educate the public about carbon sequestration and climate change, and the role of biochar in climate change mitigation. For more information on SEA Biochar, please see: http://www.biochar-international.org/regionalgroups/southeastasia.

Biochar Alaska (United States)



In the small village of Ruby, Alaska, harvest of moose, bear and salmon is part of a subsistence lifestyle. However, people are becoming more interested in growing fresh vegetables to supplement their diet due to the high cost of importing fresh produce to their villages. Gardeners in Ruby and other Alaskan villages are looking for ways to improve their soil quality and fertility using local renewable products. In these remote locations soil fertility is an issue and the use of soil enhancers is necessary. This summer, Ed Sarten, a resident of Ruby, AK, made his first batch of biochar using white spruce and moose bones using a 55 gallon barrel. Ed is going to try a germination test before applying his biochar to his garden next year, and a sample of the biochar has been sent to a lab to determine the available nutrients. We hope to improve our systems for producing biochar in small scale for gardens in Alaska and help other residents to learn about this technology to ameliorate the soil. Biochar Alaska will send updates on this work as they are available. For more information on Biochar Alaska, please see: http://www.biochar-international.org/regional/alaska.

Photos of Ruby Alaska courtesy of Sunny Castillo.

Pioneer Valley Biochar Initiative (PVBI)

As mentioned in a previous article, a CHAB Camp (Combined Heat and Biochar) event was held at NESFI during Aug. 9 - 13 led by Drs. Paul Anderson, Thomas Reed, and Hugh McLaughlin. It was attended by about 18 participants who participated in discussions and made and tested devices for making biochar, including several TLUD variations. Bob Wells and Peter Hirst (New England Biochar LLC) brought their commercial-scale Adam-Retort, which successfully produced two batches of biochar and a good amount of wood vinegar with no apparent negative impact on air quality. A tentative order has been placed for an updated version of the Retort which will be located at NESFI. Attempts will be

made to accompany biochar production with the generation of heat to be used at the NESFI farm facility. Additionally, a small scale continuous feed pyrolyzer prototype is being tested as NESFI.

More samples of char produced as a byproduct in the UMass Chemical Engineering project for preparing bio-oil using a semi-commercial scale device have been obtained and will be tested for agricultural value-if they have value, this may increase cooperative efforts for combined biochar-bio-oil production. For more information on PVBI please see: http://pvbiochar.org.

Book Review: The Biochar Revolution: Transforming Agriculture and Environment, ed. Paul Taylor

By Kelpie Wilson

I want to call this book: "Biochar, the Missing Manual." This compendium of practical how-to articles on the art and science of biochar bridges the current gap between research and implementation of biochar systems. While basic research on the mechanisms of biochar-soil interactions proceeds at research institutions around the globe-farmers, blacksmiths, colliers, and crafty inventors of all sorts have jumped into the business of biochar production and utilization. The Biochar Revolution collects the results and best practical advice that these entrepreneurs have to offer to the biochar community.

In the book you will read about the challenges of designing low-emissions biochar production systems from small-scale stoves to farm-scale pyrolyzers. Biochar producers show how they add minerals and nutrients to maximize the effectiveness of biochar, and seasoned biochar business operators share the rudiments of their business plans including information on feedstocks, flow rates, and financing. One section of the book is devoted to explaining simple tests to characterize biochar and methods for conducting valid field trials.

Because biochar is rooted in an ancient, proven practice, farmers feel empowered to experiment, and are beginning to accumulate and document their results. But because biochar is new to science, it is not always possible to account for these results in a predictable fashion. We are fortunate to have a vibrant, grassroots movement of biochar practitioners who are so generous in sharing their results with the community. When practice and theory advance to the point where they meet in the middle, then we will truly see a biochar revolution. You can pre-order the book, which has a September 2010 publication date, at www.biochar-books.com.

Upcoming Calendar Highlights

2 September - First Conference of Biochar Quebec: An Overview of Research and the Implementation of Biochar in Quebec, Canada. More information, Julie Major at: julimajor@gmail.com.

12-15 September - 3rd International Biochar Conference: IBI 2010; Location: Rio de Janeiro, Brazil; More information: http://www.ibi2010.org/

16-17 September - Workshop on Biochar - Production and Uses; Location: Appropriate Rural Technology Institute's Rural Entrepreneurship Development Centre, Phaltan, India; More information: sarah.carter@ed.ac.uk, http://biocharinnovation.wordpress.com

27-30 September - Workshop on Terra Preta Sanitation; Location: INEP, Groß Ippener, Germany ; More information: Christopher Buzie: Christopher.buzie-fru@tuhh.de, Horacio Factura: horacio.factura@tu-harburg.de

9-11 October - International Symposium on Environmental Behavior and Effects of Biomass-derived Charcoal; Location: Hangzhou, China; More information: http://www.iest.zju.edu.cn/biochar2010

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

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.

Clough T.J., Condron L.M. (2010) Biochar and the Nitrogen Cycle: Introduction. Journal of environmental quality 39:1218-1223.

Dehkhoda A.M., West A.H., Ellis N. (2010) Biochar based solid acid catalyst for biodiesel production. Applied Catalysis a-General 382:197-204.

Rillig M.C., Wagner M., Salem M., Antunes P.M., George C., Ramke H.G., Titirici M.M., Antonietti M. (2010) Material derived from hydrothermal carbonization: Effects on plant growth and arbuscular mycorrhiza. Applied Soil Ecology 45:238-242.

Salleh M.A.M., Kisiki N.H., Yusuf H.M., Ghani W. (2010) Gasification of Biochar from Empty Fruit Bunch in a Fluidized Bed Reactor. Energies 3:1344-1352.

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Woolf D., Amonette J., Street-Perrott F.A., Lehmann J., Joseph S. (2010) Sustainable biochar to mitigate global climate change. Nature Communications 1:1-9.

Yang X.B., Ying G.G., Peng P.A., Wang L., Zhao J.L., Zhang L.J., Yuan P., He H.P. (2010) Influence of Biochars on Plant Uptake and Dissipation of Two Pesticides in an Agricultural Soil. Journal of Agricultural and Food Chemistry 58:7915-7921.

Zheng W., Guo M.X., Chow T., Bennett D.N., Rajagopalan N. (2010) Sorption properties of greenwaste biochar for two triazine pesticides. Journal of Hazardous Materials 181:121-126.