



August 2013 News from the International Biochar Initiative

Participate in an IBI Public Survey on Global Biochar Business Activity

As part of our ongoing efforts to identify trends in the evolution of the biochar sector, IBI has launched a public survey to gather data on biochar enterprise activity (link to: <http://www.surveygizmo.com/s3/1325697/Biochar-Business-Survey>). IBI is requesting the participation of any business and/or organization that is active in the biochar sector to make the information gathered in the survey as complete as possible. Information collected in this survey will complement results from the IBI biochar projects survey, completed this past May.

This biochar business survey will collect data on activities related to the commercial production, distribution and marketing of biochar and biochar-related products and services. In recent years, there has been strong growth in biochar enterprise but little documentation of trends in markets, technologies, and other aspects of business operations. IBI will be using the data collected in this survey to highlight the worldwide breadth of biochar commercial activity—to look at trends in geography, feedstocks, technology, financing, and utilization, and to inform our own work and programs. The survey is directed towards three biochar business entities: 1) biochar production and/or sales; 2) biochar production equipment manufacturers; and 3) other biochar-related enterprises.

Data from the projects and business surveys will be combined, and shared with the global biochar community in aggregated form. IBI recognizes that biochar enterprises need to protect their intellectual property as part of their business models and to maintain their competitive edge. To this end, IBI will not share any information on any individual business or on any individual questions (other than basic business information such as website and location) collected in this survey. Only data that is aggregated to show overall trends in the biochar industry will be shared or made public.

Survey respondents will be directed to answer questions based on the type of biochar business entity they operate or work for. There are up to 25, mostly multiple-choice questions, and the survey should take about 20 minutes to complete. Please help us increase information on worldwide biochar activity by participating in this survey. **The deadline for responding is September 6, 2013.**

Thank you for your participation, and please let us know if you have any questions or concerns. Please take the survey at: <http://www.surveygizmo.com/s3/1325697/Biochar-Business-Survey>.

Profile: Carbon Roots International—Using Sugar Cane Bagasse in Haiti to Create Biochar (and a more Sustainable Cooking Charcoal)

Finding a more sustainable replacement for cooking charcoal in Haiti is a necessity—Haiti is severely deforested with only 1% of its forests left standing due to the huge demand for charcoal. Carbon Roots International (CRI), a US-based non-profit founded in 2010, is working on just this issue using sugar cane waste as a feedstock to produce both green charcoal briquettes as well as biochar. Working in northern Haiti, CRI now has ten staff members and is producing up to 6,000 green charcoal briquettes a day with locally-produced barrel kilns and is not able to keep up with demand. Says Ryan Delaney, CRI's Country Director, "No one has tried this in the context of Haiti; no one is doing this type of work right now, and so it is very exciting for us."



The production of both biochar and green charcoal is from the same feedstock, bagasse, the leftover residues from pressing sugar cane. Because the sugar cane is brought to centralized processing facilities for pressing to extract the syrup, there is good access to large amounts of the bagasse residue in a central location. Bagasse is also one of the few agricultural residues in Haiti that has little other useful purpose in that it is not used for animal feed or for compost. Often, Haitian farmers pile bagasse residues and burn them for disposal. The feedstock is fairly dry depending on the season, but in the wet season, keeping the material dry can be a challenge unless it is stored under a tarp. CRI has found that bagasse is a good feedstock to convert into charcoal and they get a 40 – 50% conversion based on weight. For the remainder of this article, please see: http://www.biochar-international.org/carbon_roots_international.

Photo: Drying briquettes, courtesy of Carbon Roots International

Biochar Briefs: News Roundup for August

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

Canada

Researchers under contract with the Labrador Institute and local farmers are looking at the effect of biochar in soils at Green Earth Farm in Happy Valley-Goose Bay, Labrador, Canada. Due to the area's extremely sandy soils, the biochar research team is hoping that biochar can help local farmers improve the soil's water and nutrient holding capacity, the low organic matter content, and high acidity levels. (link to: <http://www.thelabradorian.ca/News/Local/2013-07-29/article-3331651/Future-of-farming/1>).

Germany

A group from the city of Buchen is conducting a number of soil experiments using different amendments to see the effect of those amendments on crops. With scientific support from Dr.

Bruno Glaser of the University of Halle-Wittenberg, the group hopes that the field trials will show the effects of compost, terra preta, and controls with and without conventional fertilizers.

(Link to:

http://www.rnz.de/buchen/00_20130816060059_105858728_Buchen_Feldversuch_mit_dem_schwarzen_Gold.html).

Haiti

The U.S. Agency for International Development (USAID) recently announced the granting of two Development Innovation Ventures (DIV) awards in Haiti. One of those awardees is Carbon Roots International (highlighted in this newsletter) which is producing “green charcoal” briquettes and biochar. The DIV Stage 1 award of \$100,000 to Carbon Roots International will be used to test the organization’s deployment of the first green charcoal production center in northern Haiti. (link to: <http://www.haitilibre.com/en/news-9229-haiti-environment-two-usaid-awards-for-innovative-projects-in-haiti.html>)

United States

Researchers at Appalachian State University received \$45,000 from the North Carolina Agriculture Foundation to convert biomass to biochar and biofuels. The fuel gas produced by the technology is used to power a small engine, which can be used for electricity generation. The researchers plan to use the heat generated from conversion to warm their greenhouse at the local county landfill. (link to: <http://www.biomagazine.com/articles/9281/n-c-university-wins-grant-for-biofuel-biochar-project>).

A project run by a consortium of agencies is aiming to preserve a hillside at an old mine site near Durango, CO, by using straw mulch spread over 87 cubic yards of a biochar/compost mix. The mix was laid on bare areas, and tree trunks were cut to build check dams in gullies that drain the 5-acre project area. This fall, the group will plant 20,000 ponderosa pine, Gambel oak and mountain mahogany seedlings. (link to:

<http://durangoherald.com/article/20130731/NEWS06/130739908/-1/s#/storyimage/DU/20130731/NEWS06/130739908/AR/0/AR-130739908.jpg&maxw=620&maxh=400>)

Register Now for the 2013 USBI North American Biochar Symposium: Early Bird Registration Ends August 31

There couldn't be a more exciting time to join 400 colleagues for a North American conference on biochar October 13 – 16, 2013 in Amherst, MA, USA. Over the past six years, growers, scientists, engineers and entrepreneurs worldwide have experienced the remarkable properties and benefits of using biochar as a soil conditioner, as a medium for ecosystem restoration, as an agent for wastewater remediation, and even as a food additive to enhance livestock nutrition. Registration is now open for this event at: www.symposium2013.pybiochar.org/register.

- In addition to learning about exciting new developments in the field through networking and formal presentations at the event, participants will also have the opportunity to attend the following: Ignite Talks – Monday night presentations by experts in the biochar field
- Exhibit tables
- Poster Presentations & Book Signings
- A Biochar Banquet with food stations that will feature local produce grown in biochar conditioned soil, as well as a variety of meats and adult beverages enhanced by biochar
- A Video Lounge
- A post-conference field day to learn more about technologies with a hands-on approach.
- To volunteer, ask questions, or share comments, please contact the conference organizer, Karen Ribeiro at: karen@pybiochar.org

Opportunities in Biochar

- Could you use a volunteer biochar intern?
<http://www.biochar-international.org/network/bulletin-board>
- New job postings at: <http://www.biochar-international.org/network/jobs>.

Upcoming Calendar Events

- August 26 – 31: The International Conference on Agriculture, Renewable Energy and Science. Location: United Kingdom. For more information: <http://www.biochar-international.org/node/4233>.
- September 1: CHAR FEST “Up the Back”. Location: Mullumbimby, Australia. For more information: <http://www.biochar-international.org/node/4270>.
- September 1 – 13: GEPP Executive Summer School on Global Environmental Policy. Location: Geneva, Switzerland. For more information: <http://www.biochar-international.org/node/3780>.
- September 6: Agricultural and Environmental Benefits from Biochar use in ACP Countries (Bebi). Location: Rome, Italy. For more information: <http://www.biochar-international.org/node/4271>.
- September 11: Biomass 2013 International Conference with a special session on biochar. Location: Singleton, United Kingdom. For more information: <http://www.biochar-international.org/node/4272>.
- September 23 – 25: 3rd Annual World Congress of Agriculture 2013. Location: Hangzhou, China. For more information: <http://www.biochar-international.org/node/3995>.
- October 13 – 17: 2013 USBI North American Biochar Symposium: Harvesting Atmospheric Carbon: the Science and Synergies of Biochar. Location: Massachusetts, US. For more information: <http://www.biochar-international.org/node/3694>.
- October 14 – 18: 10th Meeting of the Grupo Brasileiro da Sociedade Internacional de Substâncias Húmicas (IHSS), Brazil. For more information: <http://www.biochar-international.org/node/4048>.
- October 17 – 20: International Conference on Biochars, Composts, and Digestates/2013 International Biochar Conference. Location: Bari, Italy. For more information: <http://www.biochar-international.org/node/4096>.
- October 25 – 31: The Second International Biochar Training Course held at Nanjing Agricultural University (NJAU). Location: Nanjing, China. For more information: <http://www.biochar-international.org/node/3844>.
- October 27 – 30: 2013 Geological Society of America’s Annual Meeting with a session on “Pyrogenic black carbon, or biochar, in soils and sediments, its characterization and fate, its effects on the carbon cycle and carbon sequestration, and its effects on soil properties”. Location: Colorado, US. For more information: <http://www.biochar-international.org/node/4128>.
- October 29 – 30: "bioenergy+recycling" Conference with Exhibition American-European Technology and Business Exchange. Location: Pennsylvania, US. For more information: <http://www.biochar-international.org/node/4101>.
- November 17 – 20: SETAC North America 34th Annual Meeting with “Environmental implications of biochar” symposium. Location: Tennessee, United States. For more information: <http://www.biochar-international.org/node/4094>.

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 54 regional and national biochar groups, please see IBI's website (link to: <http://www.biochar-international.org/network/communities>). This month includes an update from UB International.

UB International (UBI) is an organization involved in utilizing the potential of small scale biochar production by farmers, forestry laborers, herders and micro-entrepreneurs for soil rejuvenation, reforestation, and income enhancement. Through a program designed to encourage the exponential growth of participating communities by harnessing this potential, UBI is working towards a significant contribution to climate change mitigation in combination with ecologically friendly, sustainable rural development. UBI is implementing projects in multiple locations around the world—specifically focusing on the potential of thinly distributed feedstock (TDF) for significant climate change mitigation (CCM). Karl Frogner of UBI wrote an update on the potential of TDF for CCM in a recent post at <http://www.biochar-international.org/regional/ubi>; (July 2013 update entitled: *Timelines for Biochar Climate Change Mitigation Potential, on Hansen et al., Woolf, et al., and Amonette et al.*)

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 infringement laws, 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](#).

Bian, Rongjun; De Chen; Xiaoyu Liu; Liqiang Cui; Lianqing Li; Genxing Pan; Dan Xie; Jinwei Zheng; Xuhui Zhang; Jufeng Zheng; Andrew Chang (2013). Biochar soil amendment as a solution to prevent Cd-tainted rice from China: Results from a cross-site field experiment. *Ecological Engineering*. Volume 58, Pages 378–383.

Busch, Daniela; Arne Stark; Claudia I. Kammann; Bruno Glaser (2013). Genotoxic and phytotoxic risk assessment of fresh and treated hydrochar from hydrothermal carbonization compared to biochar from pyrolysis. *Ecotoxicology and Environmental Safety*.

Chen, Lei; Hao Zheng; Zhen Yu Wang (2013). The Formation of Toxic Compounds during Biochar Production. *Periodical Applied Mechanics and Materials* (Volumes 361 - 363). Pages 867-870.

Cornelissen G., Rutherford D.W., Arp H.P.H., Dörsch P., Kelly C.N., Rostad C.E. (2013). Sorption of Pure N₂O to Biochars and Other Organic and Inorganic Materials under Anhydrous Conditions. *Environmental Science & Technology*.

Cui, Liqiang; Jinlong Yan; Guixiang Quan; Cheng Ding; Tianming Chen; Qaiser Hussain (2013). Adsorption Behaviour of Pymetrozine by Four Kinds of Biochar from Aqueous Solution. *Adsorption Science & Technology*. Volume 31, Number 6. Pages 477-488.

Denyes, Mackenzie J.; Allison Rutter; Barbara A. Zee (2013). In situ application of activated carbon and biochar to PCB-contaminated soil and the effects of mixing regime. *Environmental Pollution*. Volume 182, Pages 201–208.

Dorais, M.; Valérie Gravel; Claudine Ménard (2013). Organic potted plants amended with biochar: its effect on growth and *Pythium* colonization. *Canadian Journal of Plant Science*.

Doughty, Christopher E.; Daniel B. Metcalfe; Mauricio C. da Costa; Alex A.R. de Oliveira; G. F.C. Neto; João A. Silva; Luiz E.O.C. Aragão; Samuel S. Almeida; Carlos A. Quesada; Cecile A.J. Girardin; Kate Halladay; Anthony C.L. da Costa; Yadvinder Malhi (2013). The production, allocation and cycling of carbon in a forest on fertile terra preta soil in eastern Amazonia compared with a forest on adjacent infertile soil. *Plant Ecology & Diversity*.

Elleuch, Amal; Ahlem Boussetta; Kamel Halouani; Yongdan Li (2013). Experimental investigation of Direct Carbon Fuel Cell fueled by almond shell biochar: Part II. Improvement of cell stability and performance by a three-layer planar configuration. *International Journal of Hydrogen Energy*.

Farrell, Mark; Lynne M. Macdonald; Greg Butler; Ivan Chirino-Valle; Leo M. Condon (2013). Biochar and fertiliser applications influence phosphorus fractionation and wheat yield. *Biology and Fertility of Soils*.

Feiner, Roland; Nikolaus Schwaiger; Hannes Pucher; Lisa Ellmaier; Peter Pucher and Matthäus Siebenhofer (2013). Liquefaction of Pyrolysis derived Biochar: A new step towards biofuel from renewable resource. *RSC Advances*.

Jia, Junxiang; Li Bo; Chen Zhaozhi; Xie Zubin; Xiong Zhengqin (2013). Effects of biochar application on vegetable production and emissions of N₂O and CH₄. *Soil science and plant nutrition*.

Jien, Shih-Hao; Chien-Sheng Wang (2013). Effects of biochar on soil properties and erosion potential in a highly weathered soil? *CATENA*. Volume 110, Pages 225–233.

Lai Wei-Yu; Chao-Ming Lai; Guang-Ruei Ke; Ren-Shih Chung; Chien-Teh Chen; Chih-Hsin Cheng; Chuang-Wen Pai; Szu-Yun Chen; Chang-Chun Chen (2013). The effects of woodchip biochar application on crop yield, carbon sequestration and greenhouse gas emissions from soils planted with rice or leaf beet. *Journal of the Taiwan Institute of Chemical Engineers*.

Liu, Ning; Chong Jun Zhou; Shi Feng Fu; Muhammad Imran Ashraf; En Feng Zhao; Hui Shi; Xiao Ri Han; Zhi Bai Hong (2013). Study on Characteristics of Ammonium Nitrogen Adsorption by Biochar Prepared in Different Temperature. *Advanced Materials Research (Volumes 724 - 725)*.

Liu, Zhengang; Rajasekhar Balasubramanian (2013). A comparison of thermal behaviors of raw biomass, pyrolytic biochar and their blends with lignite. *Bioresource Technology*.

Mandal, S.; R. K. Singh, A. Kumar, B. C. Verma, S. V. Ngachan (2013). Characteristics of Weed Biomass-derived Biochar and Their Effect on Properties of Beehive Briquettes. *Indian Journal of Hill Farming* 26(1):8-12; http://www.kiran.nic.in/pdf/IJHF/Vol26_1/hillfarming26-1.pdf#page=8.

Masto, R. Ebhin; Md. A. Ansari; J. George; V.A. Selvi; L.C. Ram (2013). Co-application of biochar and lignite fly ash on soil nutrients and biological parameters at different crop growth stages of *Zea mays*. *Ecological Engineering*. Volume 58, Pages 314–322.

Masto, R. Ebhin; Sandeep Kumar; T.K. Rout; Pinaki Sarkar; Joshy George; L.C. Ram (2013). Biochar from water hyacinth (*Eichornia crassipes*) and its impact on soil biological activity. *CATENA*.

Melo, Leonidas C.A.; Aline R. Coscione; Cleide A. Abreu; Aline P. Puga; Otavio A. Camargo (2013). Influence of Pyrolysis Temperature on Cadmium and Zinc Sorption Capacity of Sugar Cane Straw-Derived Biochar. *Bioresources* 8(4) 4992-5004.

Méndez, A.; A.M. Tarquis; A. Saa-Requejo; F. Guerrero, G. Gascó (2013). Influence of pyrolysis temperature on composted sewage sludge biochar priming effect in a loamy soil. *Chemosphere*.

Qian, Tingting; Xuesong Zhang; Jianyang Hu; Hong Jiang (2013). Effects of environmental conditions on the release of phosphorus from biochar. *Chemosphere*.

Qin, Gang; Dan Gong; Mei-Ying Fan (2013). Bioremediation of petroleum-contaminated soil by biostimulation amended with biochar. *International Biodeterioration & Biodegradation*. Volume 85, Pages 150–155.

Scharenbroch, Bryant C.; Elsa N. Meza; Michelle Catania; and Kelby Fite (2013). Biochar and Biosolids Increase Tree Growth and Improve Soil Quality for Urban Landscapes. *American Society of Agronomy*.

Tammeorg, Priit; Asko Simojoki; Pirjo Mäkelä; Frederick L. Stoddard; Laura Alakukku; Juha Helenius (2013). Biochar application to a fertile sandy clay loam in boreal conditions: effects on soil properties and yield formation of wheat, turnip rape and faba bean. *Plant and Soil*.

Vardon, Derek R.; Bryan R. Moser; Wei Zheng; Katie Witkin; Roque L. Evangelista; Timothy J. Strathmann; Kishore Rajagopalan; and Brajendra K. Sharma (2013). Complete Utilization of Spent Coffee Grounds To Produce Biodiesel, Bio-Oil, and Biochar. *ACS Sustainable Chem. Eng.*

Wang, Buyun; Cuiping Li; Hui Liang (2013). Biobleaching of heavy metal from woody biochar using *Acidithiobacillus ferrooxidans* and activation for adsorption. *Bioresource Technology*.

Zhang, Chao; Zaihui Fu; Baohua Dai; Shunqin Zen; Yachun Liu; Qiong Xu; Steven Robert Kirk; and Dulin Yin (2013). Chlorocuprate ionic liquid functionalized biochar sulfonic acid as an efficiently biomimetic catalyst for direct hydrolysis of bamboo under microwave irradiation. *Industrial and Engineering Chemistry Research*.

Zhang, Zhen Yu; Jun Meng; Shu Dang; Ming Chao Gao; Wen Fu Che (2013). Research on Cadmium Adsorption-Desorption Dynamics of Biochar. *Advanced Materials Research (Volumes 726 - 731)*.