



## 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**

January 2013

### What will 2013 look like for IBI?

By IBI Executive Director, Debbie Reed

In this new year, IBI plans a continued focus on providing the necessary underpinnings of a successful biochar industry at all scales, to benefit soil health and productivity, and to combat global climate change. We believe that sustainable and well designed biochar systems and projects with measureable impacts will most benefit biochar implementation and acceptance worldwide by providing operational models that can be replicated. As part of this focus, we will:

- Soon finalize and launch the *IBI Biochar Certification Program*, the first such biochar certification program in the world, to provide additional certainty in the biochar marketplace;
- Continue working on a *Biochar Offsets Protocol* with our partners, including The Climate Trust, who is leading this effort (<http://www.biochar-international.org/protocol>), in order to provide the necessary technical documentation to support the inclusion of biochar projects in carbon markets and global climate change mitigation programs;
- Draft full *IBI Biochar Sustainability Guidelines* with stakeholder input, to provide additional guidance and certainty to the biochar community, to our stakeholders and the marketplace (<http://www.biochar-international.org/sustainability>);
- Increase biochar project and commercialization data tracking in order to describe the state of the biochar industry, to track its incredible growth and document success stories, and to provide this information to investors and potential supporters who regularly seek such information;
- Continue to support policy efforts which can increase support for biochar research, development, demonstration and deployment, at national and international levels;
- Continue to publicize leading biochar news (<http://www.biochar-international.org/newsbriefs>); projects (<http://www.biochar-international.org/projects/practitioner/profiles>); events and research (<http://www.biochar-international.org/biblio>); through our website, newsletter (<http://www.biochar-international.org/newsletter>), and regional and national conferences; and
- Continue to [support and participate in the many international biochar conferences](#) where the biochar community convenes and shares and learns from each other.

We thank you for another year of support and mutual learning and progress, and extend our warmest wishes to you in 2013. We ask for your [continued support](#) as we expand the services we offer and create new programs. Thank you again for your support of IBI and biochar. Please feel free to contact me with questions or comments on IBI.

Regards,

Debbie Reed  
Executive Director, IBI

## IBI Biochar Certification Program Announcements

In preparation for a final legal review, IBI is wrapping up its review of all program materials for the *IBI Biochar Certification Program*. This additional review will further ensure all program materials and tools are user-friendly for biochar manufacturers/program participants. The *IBI Biochar Certification Program* process will be fully accessible online, allowing biochar manufacturers/program participants to register, apply, and submit all required documentation electronically.

IBI is working hard to launch the *IBI Biochar Certification Program* this quarter (2013). Legal review of the *IBI Biochar Certification Program* is one of the final and critical steps before an official roll out. With the launch of the *IBI Biochar Certification Program*, IBI will be introducing the first-of-its-kind biochar certification program in the United States, allowing biochar manufacturers to distinguish themselves in the marketplace by enabling them to label their biochar as IBI-certified, and thus meeting the criteria of the *IBI Biochar Standards*. This is an exciting time for biochar and IBI sees this program helping with the important task of promoting biochar and its commercial expansion.

For questions or further inquiries regarding the *IBI Biochar Certification Program*, please contact us at [certification@biochar-international.org](mailto:certification@biochar-international.org).

## Biochar Carbon Stability Test for Carbon Market Offset Protocol Development

IBI and a previously-formed Expert Panel have completed a final draft standard test methodology for measuring the stable carbon component of biochar. The test methodology will be incorporated into the latest draft of the Biochar Carbon Offset Protocol being developed with our project partners The Climate Trust and The Prasino Group.

We take this opportunity to reiterate our gratitude towards the Expert Panel members, who have donated their time and expertise to the development of a stable carbon test methodology, and to our Project Partners in this effort. We anticipate that we will soon announce a comment period on the draft Biochar Carbon Offset Protocol, to be accompanied by outreach to the global biochar community and stakeholders to seek input and comments to the draft.

## IBI Internship Opportunity to Support the Biochar Industry

Are you interested in biochar? Are you looking to contribute your skills to the growth of an emerging industry in the sustainable development and clean energy arenas? Do you have a strong background in online research and significant experience using database tools and spreadsheets along with basic writing and proofreading skills? If so, please consider working as an Industry Research Intern with the International Biochar Initiative (IBI)—the leading non-profit promoting biochar research and commercialization. The intern will be primarily responsible for (listed in order of priority and time commitment):

1. Compiling information on companies involved in the production and distribution of biochar, pyrolysis equipment, and related activities;
2. Developing web-based surveys and conducting telephone interviews with producers and consumers to document biochar industry trends; and
3. Assisting IBI staff in other commercialization-related activities.

The internship is unpaid but the intern will gain valuable experience working with a diverse team of professionals at IBI. The time commitment is 8 hours per week from February 1 (or sooner) through April 30. The intern will work remotely and is expected to be in regular communication with IBI staff on a weekly basis. Priority will be given to students working towards science or business degrees. IBI can provide the intern a letter confirming service at the conclusion of the internship.

If you are interested in this opportunity, please email us a brief cover letter telling us why you would be a good fit for this internship. In the cover letter, describe your experience in these three areas (listed in order of importance):

1. Web-based research, and manipulating databases and spreadsheets, primarily Microsoft Excel;
2. Biochar history and use; and
3. Business development.

Send the cover letter and your resume to Shiva Scotti at [4IBIJobs@gmail.com](mailto:4IBIJobs@gmail.com) by February 1. For more information on IBI visit our website <http://www.biochar-international.org/>. Please note, cover letters MUST be included—any resume submitted without a cover letter addressing all 3 of the points above will be discarded, unread. Thank you for your interest!

## Business and Organization Member Updates

A listing of all current IBI Business and Organization Members can be found on our website at: <http://www.biochar-international.org/IBI-business-members>. For more information on a membership or to join, please see: <http://www.biochar-international.org/join>. Please note, Business and Organization descriptions are submitted by each individual entity, and are not developed or written by IBI.

### **Biochar Supreme**

Biochar Supreme is a group of researchers, engineers, farmers, horticulturists and landscape professionals who have discovered the value of biochar in their professional work with plants and soils. They formed Biochar Supreme to help make biochar “the supreme ingredient for healthy soils”, available to everyone.



Their biochar is made from 100% pure, unprocessed wood residues and it contains more than 75% highly stable organic carbon. It is lightweight and porous with high surface area and superior water holding capacity. They are based on the US West Coast and are ready to ship their top-rated product to locations anywhere in the US and Canada. They supply one cubic foot bags of biochar for the retail market and they ship cubic yard super sacks or 80-yard truckloads at competitive bulk prices.

For more information please visit: [www.biocharsupreme.com](http://www.biocharsupreme.com) or contact Renel Anderson [renelinvan@yahoo.com](mailto:renelinvan@yahoo.com).

### **Renewing Business or Organization Members:**

#### **Burdekin Bowen Integrated Floodplain Management Advisory Committee Inc. (BBIFMAC)**

BBIFMAC is a not-for-profit community natural resource agency covering the catchment areas of the Bogie, Don, Elliot, Burdekin and Haughton Rivers in the Burdekin and Whitsunday Shires in North Queensland, Australia. BBIFMAC's overall vision is to assist in the management of the natural resources in such a way as to



ensure social wellbeing, primary production, and ecological sustainability of the Burdekin-Bowen floodplain. Being a non-governmental, community-owned NRM agency provides the unique opportunity for BBIFMAC to engage industry and community in a neutral and unbiased manner. BBIFMAC promotes an integrated, strategic and community-driven approach to the management of natural resources. We support the sustainable development of primary industries and the local economy for the long term benefit of present and future generations.

For more information, please see <http://www.bbifmac.org.au> or contact Tom McShane at [tom@bbifmac.org.au](mailto:tom@bbifmac.org.au).

**Guangdong Dazhong Agricultural Science and Technology Co. Ltd**

Guangdong Dazhong Agricultural Science and Technology Co. Ltd is an innovative fertilizer manufacturer, and is one of the leading organic fertilizer producers in China. As a leader of low carbon and eco-friendly agriculture in China, Guangdong Dazhong Agriculture Science Co. has adhered to the mission of a low carbon & high yield fertilizer to be the most cost-effective agricultural products manufacturer. They are located in Dongguan, Guangdong Province, China and are looking to include biochar in their product range in the near future.



For more information on the company, please visit: <http://www.dazhongnk.cn/english/index.asp>.

[Profile: The SCAD Soil Fertility Project: Biochar Mixed with Slurry in India](#)

SCAD (Social Change and Development) is an organization based in Southern India that works with the area's rural poor. The organization provides villagers with opportunities to improve their education, health, and income, including through training programs in sustainable organic agriculture. One of SCAD's agriculture programs, called the Soil Fertility Project, aims to increase the quality and fertility of soil using primarily agricultural and market waste. SCAD has become increasingly interested in biochar as the organization's understanding of the potential benefits of biochar has increased.

Much of the organization's initial work with biochar has been through field observations conducted at SCAD's 15-acre organic farm. The farm was developed three years ago on land previously covered in prosopis, an invasive bush that allows rain to leach the surface soil, leaving a semi-desert soil. A team at SCAD has been carrying out additional tests in villages in order to enable women's groups and farmers to see different approaches that might increase the yield of their crops through the use of biochar and other soil amendments. The team believes that farmers will adopt new practices only when improvements are demonstrated onsite. SCAD works in 500 villages, each of which has perhaps 50 small-scale farmers, so the potential for improving the structure of soil and the yield of crops is significant. The team, under SCAD's director, Dr. Amili Babu, is led by Mr Nagarajan and includes agricultural scientists and microbiologists, including Dr. Ravi Kumar (who invented the Anila cooking stove). David Friese-Greene and James Bruges worked with the group to identify appropriate production equipment and have been providing technical advice, as well. Funding for the project was provided by a private charity. To read the remainder of this story, please see: <http://www.biochar-international.org/profile/SCAD>.

[Biochar Briefs: News Roundup for January](#)

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

## **Australia**

A bamboo plantation at Jiggi Australia is the home of an experimental biochar kiln, designed to create an enhanced biochar soil additive, using a blend of chicken manure, straw, and clay as well as woody fiber (in this case bamboo) in an attempt to recreate Terra Preta soils found in the Amazon basin. Link to: <http://www.echonews.com.au/news/jiggi-project-at-forefront-of-biochar-revolution/1719528/>.

Central Queensland University researchers are helping the poultry industry improve bird health by adding biochar to poultry feed. Link to: <http://www.gladstoneobserver.com.au/news/universitys-green-chickens-produce-carbon-smart-po/1709290/>.

## **Italy**

On January 17 and 18, 2013, the 1st Mediterranean Symposium on Biochar was held in Italy. Franco Miglietta, a researcher at Ibimet and President of the Italian National Research Council and Biochar, was a key speaker. He highlighted the process of recognizing biochar as a soil amendment to allow for its use in Italy. Link to: <http://www.zeroemission.tv/portal/news/topic/Emissioni/id/20279/Agricoltura-il-ruolo-del-Biochar-nel-taglio-delle-emissioni>

## **Nigeria**

The Social Development Fund of the Embassy of France, Pro-Natura International Nigeria, and A.P. Leventis Ornithological Research Institute are working to highlight the benefits of biochar in Nigeria. They recently presented on biochar at workshops in Abuja and Jos. Additionally, a biochar-enriched Super Vegetable Garden (a biochar pilot project) is ongoing in Jos, Plateau State. Link to: <http://allafrica.com/stories/201301070843.html>.

## **United States**

The Aspen Center for Environmental Studies (ACES) in Colorado has an experiment under way at their Rock Bottom Ranch property to regenerate cottonwoods. In the process, large piles of wood chips have been created to fuel a planned biochar pilot project at the ranch. ACES hopes to create a small operation to produce biochar at Rock Bottom Ranch once it acquires or creates a small pyrolyzer. Link to: <http://www.aspentimes.com/article/20130115/NEWS/130119923/1077&ParentProfile=1058>.

## Opportunities in Biochar

- Become a sponsor for the 2013 North American Biochar Symposium or submit an abstract. For more information: <http://symposium2013.pvbiochar.org>.
- Submit an Expression of Interest for the Second International Biochar Training Course at Nanjing Agricultural University (NJAU), planned for October, 2013. For more information: <http://www.biochar-international.org/node/3845>.
- Receive a free subscription to Biomass Magazine. For more information: <http://www.biochar-international.org/node/3797>.
- Download an Open Source ebook: *Understanding Stoves for Environment and Humanity* by Dr. N. Sai Bhaskar Reddy, published by MetaMeta, The Netherlands. For more information: <http://www.biochar-international.org/node/3690>.
- New job postings at: <http://www.biochar-international.org/network/jobs>.

## Upcoming Calendar Events

- January 26 – 27, 2013: Biochar Bash 2013. Location: Biochar Industries Kunghur, Australia. For more information: <http://www.biochar-international.org/node/3884>.
- January 28, 2013: Pacific Northwest Biochar Working Group Conference. Location: Corvallis OR, United States. For more information: <http://www.biochar-international.org/node/3880>.

- February 7 – 8, 2013: 31<sup>st</sup> International Activated Carbon Conference. Location: Honolulu HI, USA. For more information: <http://www.biochar-international.org/node/3787>.
- February 14 – 15, 2013: 2<sup>nd</sup> Nordic Biochar Seminar. Location: Helsinki, Finland. For more information: <http://www.biochar-international.org/node/3447>.
- February 14 – 18, 2013: 2013 AAAS Annual Meeting. Location: Boston, MA, USA. For more information: <http://www.biochar-international.org/node/3779>.
- March 18 – 22, 2013: Global Alliance for Clean Cookstove Clean Cooking Forum 2013: Igniting Change, Fueling Markets & Sparking Adoption. Location: Phnom Penh, Cambodia. For more information: <http://www.biochar-international.org/node/3886>.
- March 19 – 20, 2013: 2-day seminar on the Commercialization of Sustainable Biochar. Location: Hotel Equatorial Bangi, Malaysia. For more information: <http://www.biochar-international.org/node/3895>.
- April 5: Illinois Biochar Group Spring Meeting. Location: Urbana-Champaign, IL, USA. For more information: <http://www.biochar-international.org/node/3896>.
- April 6: Florida Biochar Regional Meeting. Location: Melbourne, FL, USA. For more information: <http://www.facebook.com/pages/Florida-biochar/438352616184448>.
- April 7 – 12, 2013: Biochar for soil remediation and global warming mitigation at EGU 2013. Location: Vienna, Austria. For more information: <http://www.biochar-international.org/node/3849>.
- April 8 – 10, 2013: International Biomass Conference and Expo. Location: Minneapolis, MN, USA. For more information: <http://www.biochar-international.org/node/3685>.
- April 17 – 18, 2013: National Conference on Philippine Biochar. Location: Quezon City, The Philippines. For more information: <http://www.biochar-international.org/node/3853>.

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

### Regional Biochar Group Updates

To read more on the 51 regional and national biochar groups, please see IBI's website (link to: <http://www.biochar-international.org/network/communities>). This month includes three new groups: the Biochar Association of Indonesia, the British Biochar Foundation (BBF), and the Zhejiang Biochar Engineering Technology Research Center (China). Additionally, there are updates from the Philippine Biochar Association, Florida Biochar (United States), the Illinois Biochar Group (United States), and the Pioneer Valley Biochar Initiative (PVBI, United States).

#### **The Biochar Association of Indonesia**

The Biochar Association of Indonesia (ABI) was formed in Balikpapan on December 11, 2012. The establishment of the ABI was on the initiative of Prof. Dr. Ir. Wani Hadi Utomo and the formation of the ABI was conducted at the Faculty of Agriculture, University of Tribhuwana Tunggaladewi, Malang. For more information on this group, please contact Mrs. Widowati ([widwidowati@gmail.com](mailto:widwidowati@gmail.com)). The ABI is the 50<sup>th</sup> biochar group that has formed per IBI's records. Congratulations.

The ABI believes that in order to develop strong agriculture, the roles and functions of biochar need to be developed—for this, there needs to be a coordinating institution that can inspire, collaborate, provide communications, training, research and development around biochar. For more information, please see: <http://www.biochar-international.org/regional/Indonesia>.

#### **The British Biochar Foundation (BBF)**

The British Biochar Foundation is a not-for-profit membership organization aiming to support the emerging research, sustainable production, and uses of biochar in the UK. They are currently focusing on supporting the sustainable development of a budding biochar market for the horticultural and farming industry as well as encouraging use and production by domestic

gardeners, allotment holders, and community groups. They welcome participation by all those who want to store carbon and/or who wish to improve soil health.

The BBF works in tandem with the biochar research community and is affiliated with the European Biochar Foundation, although it acts independently from academic, governmental, and commercial organizations. BBF members include farmers, charcoal producers, local communities, project developers, companies, charities, community interest companies, and social enterprises committed to the sustainable development and deployment of biochar in the UK. For more information, please see: <http://www.britishbiocharfoundation.org/>.

### **Zhejiang Biochar Engineering Technology Research Center (China)**

The Zhejiang Biochar Engineering Technology Research Center (ZJBETRC) has been established by Zhejiang Academy of Agricultural Sciences (ZAAS) in conjunction with the China National Bamboo Research Center (CNBRC), as dispatched by Science and Technology Department of Zhejiang Province, Zhejiang Provincial Department of Finance, Zhejiang Provincial Department and Reform Commission on Aug 27, 2012.

Dr Prof. Yang Shengmao has been appointed as the head of the center. This center will focus on solving the integrated utilization problem of waste biomass from agriculture and forestry. It will form an international learning organization to focus on the basic research of biochar, development of carbonization equipment, application, and industrialization of biochar technology. It will become a multiple research and development platform for personnel training, academic exchange, technical learning, and industrial demonstration. For more information, please see: [http://www.biochar-international.org/Zhejiang\\_Biochar](http://www.biochar-international.org/Zhejiang_Biochar).

### **Philippine Biochar Association**

To promote the production and use of biochar, the Philippine Biochar Association (PBiA) was formed. PBiA seeks to contribute significantly to the mitigation of GHG, and to help farmers adapt to climate change. PBiA seeks the contribution of various sectors such as the academe, national and local government, relevant government agencies, and businesses to come together and share the vision in the promotion of biochar in the Philippines. The PBiA is planning a National Conference on Philippine Biochar March 17 – 18, 2013 in Quezon City. The objectives of the conference include developing a national agenda on the use of biochar in agriculture and environment. The agenda will center around: Research and Development, Farm Adaptation, Community Development and Livelihood; establishing a network of biochar practitioners and advocates; sharing information on Biochar and Biochar Practices; and integrating activities on Biochar and make PBiA as central repository of Biochar activities and implementers. For more information, please see: <http://www.biochar-international.org/node/3853>.

### **Florida Biochar (United States)**

Florida Biochar will host a regional meeting on April 6th in Melbourne, FL, USA. The meeting will include lectures, demonstrations in how to build your own kiln and guest speakers. Free samples will be available. Details will be posted on the Florida Biochar website at <http://www.facebook.com/pages/Florida-biochar/438352616184448>.

### **Illinois Biochar Group (United States)**

The Illinois Biochar Group will hold its spring meeting on Friday, April 5, at the Illinois Sustainable Technology Center (ISTC) on the campus of the University of Illinois at Urbana-Champaign. The meeting will be held from 1:15 to 3 pm CST with biochar research/project updates given by IBG members and there will also be discussion about the upcoming Midwest Biochar Conference that IBG is helping to organize. Prior to the meeting, there will be a seminar from noon - 1 pm CST given by Dr. Sandeep Agnihotri of ISTC on "Porosity of Biochar". This seminar will be broadcast live and also archived on the ISTC website [www.istc.illinois.edu](http://www.istc.illinois.edu) and IBG website [www.biochar.illinos.edu](http://www.biochar.illinos.edu) for later viewing. If you cannot attend the event at ISTC, you may view the webinar live by registering at: <https://www4.gotomeeting.com/register/124000839>. Attendance for seminar and meeting is free and open to the public.

The Illinois Biochar Group, in conjunction with the Illinois Sustainable Technology Center at the University of Illinois and the U.S. Department of Agriculture as co-organizers, announces the first Midwest Biochar Conference which will be held on June 14, 2013, in Champaign, IL. The conference will feature presentations on the latest in biochar research, exhibit space for vendors, and plenty of opportunities for discussion with those interested in all aspects of biochar work. The event will take place at the I-Hotel Conference Center from 8:00 am to 4:30 pm CST, with a reception following from 4:30 - 6:00 pm. Abstract submission will open Feb. 11, 2013. Conference registration will open approximately May 1, 2013. Plan to register early as space will be limited. Please watch the IBG website at [www.biochar.illinois.edu](http://www.biochar.illinois.edu) for more information. For questions, please contact IBG coordinator Nancy Holm at [naholm@illinois.edu](mailto:naholm@illinois.edu).

### **Pioneer Valley Biochar Initiative (PVBI, United States)**

PVBI is organizing the *2013 North American Biochar Symposium Harvesting Hope: The Science and Synergies of Biochar*. This biochar symposium is designed for farmers, foresters, researchers, policymakers, biochar producers and entrepreneurs, and especially students and citizens who want to learn more about biochar as an alternative to fossil fuel-based fertilizers/pesticides and energy. The conference organizers announce a call for papers due March 4, 2013. There are four main tracks for speakers:

1. Feedstocks & Technology
2. Benefits of Biochar - agriculture (farm and forest) climate, water, energy
3. Scale, Sales & Marketing
4. Community Engagement and Policy

For details on each track and to submit an abstract, please see:  
<http://symposium2013.pvbiochar.org/tracks>.

### 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](#).

Aller, Deborah (2012). The Potential of Biochar produced from *Eichhornia crassipes* and *Prosopis juliflora* to Enhance Soil Water Holding Capacity of Drylands Soils. Master's Thesis, The University of Edinburgh.

Anderson, Nathaniel; J. Greg Jones; Deborah Page-Dumroese; Daniel McCollum; Stephen Baker; Daniel Loeffler; Woodam Chung (2013). A Comparison of Producer Gas, Biochar, and Activated Carbon from Two Distributed Scale Thermochemical Conversion Systems Used to Process Forest Biomass. *Energies*.

Arif, Mohammad; Kawsar Ali; Fazal Munsif; Wiqar Ahmad; Akhlaq Ahmad; Khalid Naveed (2012). Effect of Biochar, Fym and Nitrogran on Weeds and Maize Phenology. *Pak. J. Weed Sci. Res.*, 18(4): 475-484; [http://www.wssp.org.pk/5-PJWSR-18\(4\)475-484-2012.pdf](http://www.wssp.org.pk/5-PJWSR-18(4)475-484-2012.pdf).

Basso, Andres S.; Fernando E. Miguez; David A. Laird; Robert Horton; Mark Westgate (2012). Assessing potential of biochar for increasing water-holding capacity of sandy soils. *GCB Bioenergy*.

Becker, R.; Dorgerloh, U.; Helmig, M.; Mumme, J.; Diakité, M.; Nehls, I. (2013). Hydrothermally carbonized plant materials: patterns of volatile organic compounds. *Bioresource Technology* 130, 621-628.



Biederman, Lori A.; W. Stanley Harpole (2012). Biochar and its effects on plant productivity and nutrient cycling: a meta-analysis. GCB Bioenergy.

Crombie, Kyle; Ondrej Masek; Saran P. Sohi; Peter Brownsort; Andrew Cross (2012). The effect of pyrolysis conditions on biochar stability as determined by three methods. GCB Bioenergy.

Cross, Andrew; Saran P. Sohi (2012). A method for screening the relative long-term stability of biochar. GCB Bioenergy.

Ding WC, Tian XM, Wang DY, Zeng XL, Xu Q, Chen JK, Ai XY (2012). Mechanism of Cr(VI) removal from aqueous solution using biochar promoted by humic acid. College of Resources and Environment, Southwest University, Chongqing 400715, China; 33(11):3847-53.

Field, John L.; Catherine M. H. Keske; Greta L. Birch; Morgan W. DeFoort; M. Francesca Cotrufo (2012). Distributed biochar and bioenergy coproduction: a regionally specific case study of environmental benefits and economic impacts. GCB Bioenergy.

Dharmakeerthi, Randothage Saman; Jayalath Arachchige Chandrasiri; Vishani Udayanga Edirimanne (2012). Effect of rubber wood biochar on nutrition and growth of nursery plants of *Hevea brasiliensis* established in an Ultisol. <http://www.springerplus.com/content/pdf/2193-1801-1-84.pdf>.

Huang, Yu-Fong; Pei-Te Chiueh; Fu-Siang Syu; Shang-Lien Lo (2012). Life cycle assessment of biochar cofiring with coal. Bioresource Technology.

Jablonowski, Nicolai David; Nils Borchard; Petra Zajkoska; Jesus Dionisio; Fernández-Bayo; Rosane Martinazzo; Anne E. Berns; Peter Burauel (2012). Biochar-mediated 14C-atrazine mineralization in atrazine-adapted soils from Belgium and Brazil. J. Agric. Food Chem.

LeCroy, Chase; Caroline A. Masiello; Jennifer A. Rudgers; William C. Hockaday; Jonathan J. Silberg (2012). Nitrogen, biochar, and mycorrhizae: Alteration of the symbiosis and oxidation of the char surface. Soil Biology and Biochemistry.

Li, Mi; Qiang Liu; Lijing Guo; Yaping Zhang; Zhenjun Lou; Yang Wang; Guangren Qian (2012). Cu(II) removal from aqueous solution by *Spartina alterniflora* derived biochar. Bioresource Technology.

Lin, Y.; P. Munroe; S. Joseph; A. Ziolkowski; L. van Zwieten; S. Kimber; J. Rust (2012). Chemical and structural analysis of enhanced biochars: Thermally treated mixtures of biochar, chicken litter, clay and minerals. Chemosphere.

Liu, Xiang-Hong; Feng-Peng Han; Xing-Chang Zhang (2012). Effect of Biochar on Soil Aggregates in the Loess Plateau: Results from Incubation Experiments. International Journal of Agriculture and Biology. [http://www.fspublishers.org/ijab/past-issues/IJABVOL\\_14\\_NO\\_6/19.pdf](http://www.fspublishers.org/ijab/past-issues/IJABVOL_14_NO_6/19.pdf).

Lugato, Emanuele; Francesco P. Vaccari; Lorenzo Genesio; Silvia Baronti; Alessandro Pozzi; Mireille Rack; Jeremy Woods; Gianluca Simonetti; Luca Montanarella; Franco Miglietta (2012). An energy-biochar chain involving biomass gasification and rice cultivation in Northern Italy. GCB Bioenergy.

McCormack, Sarah A.; Nick Ostle; Richard D. Bardgett; David W. Hopkins; Adam J. Vanbergen (2013). Biochar in bioenergy cropping systems: impacts on soil faunal communities and linked ecosystem processes. GCB Bioenergy.

Noor, Nurhidayah Mohamed; Adilah Shariff; Nurhayati Abdullah (2012). Slow Pyrolysis of Cassava Wastes for Biochar Production and Characterization. Iranica Journal of Energy & Environment 3 (Special Issue on Environmental Technology): 60-65. [http://idosi.org/ijee/3\(S\)12/10.pdf](http://idosi.org/ijee/3(S)12/10.pdf).

Sparrevik, Magnus; John Field; Vegard Martinsen; Gijs D. Breedveld; Gerard Cornelissen (2012). Life cycle assessment to evaluate the environmental impact of biochar implementation in conservation agriculture in Zambia. *Environ. Sci. Technol.*

Velez, Thelma I., (2012). Measuring the Impact of Melaleuca quinquenervia Biochar Application on Soil Quality, Plant Growth, and Microbial Gas Flux. FIU Electronic Theses and Dissertations. Paper 775; <http://digitalcommons.fiu.edu/etd/775>.

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Wang, Dengjun; Wei Zhang; Xiuzhen Hao; Dongmei Zhou (2012). Transport of Biochar Particles in Saturated Granular Media: Effects of Pyrolysis Temperature and Particle Size. *Environ. Sci. Technology*.

Zhang, Xiao-Ke,; Qi LI, Wen-Ju Liang; Min Zhang; Xue-Lian Bao; Zu-Bin Xie (2013). Soil Nematode Response to Biochar Addition in a Chinese Wheat Field. *Pedosphere*.

Zwart Drew C.; Soo-Hyung Kim (2012). Biochar Amendment Increases Resistance to Stem Lesions Caused by *Phytophthora* spp. in Tree Seedlings. *Hort Science*.