



## 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**

### October 2016 News from the International Biochar Initiative for Members and Supporters

#### IBI Board commits to ambitious new Vision - 1 Billion tons of biochar per year!

Members of the Board of IBI convened in Nanjing, China on October 17 - 18<sup>th</sup> for their annual board meeting to review achievements and discuss the future direction of the organization. Board members reviewed the challenges and progress in promoting biochar in different policy initiatives in the US, Europe and China in 2016. While progress is being made, the Board would like to encourage greater progress towards building a successful biochar industry. With that in mind the Board has updated IBI's Vision statement to provide a clear and ambitious goal of "Generating one billion tons of biochar per year within the next 50 years".

*Our Mission: to provide a platform for fostering stakeholder collaboration, good industry practices, and environmental and ethical standards to support biochar systems that are safe and economically viable.*

We will need all hands on deck to achieve this aggressive yet achievable goal. We look forward to working with members on strategies to measure and meet this target. A new Development Committee was created to assist IBI with fundraising efforts.

#### IBI Memberships Now Available!

After temporarily suspending IBI membership, the IBI Board has voted to reinstate a membership model effective immediately. We encourage all those that have yet to renew their membership, to do so now via the [IBI website](#).

#### IBI Asia Launched in Nanjing, China

IBI and Nanjing Agricultural University (NJAU) launched IBI Asia at a meeting hosted by Genxing Pan, IBI Board member and professor of the Institute of Resources, Ecosystem and Environment of Agriculture. Dr. Pan and his team are providing administrative services to IBI and provide an important link to biochar developments in China and Asia. IBIS Asia will be housed at the NJAU Biochar and Green Technology Center which will include a research and innovation building, office building, feedstock and production floor, exhibit of biochar technologies, training, and lodging facilities, a greenhouse, and a wetland Eco-park. The center will operate with the support and collaboration of with Soiltec China and other organizations producing biochar products.



### International Workshop on Biochar and Sustainable Agriculture

Nanjing Agricultural University (NJAU) hosted an International Workshop on Biochar and Sustainable Agriculture, October 18-25. Dr. Genxing Pan and several dignitaries opened the workshop which was attended by engineers, agronomists and soil scientists representing biochar technology providers, biochar suppliers and fertilizers companies and students. Opening presentations were from IBI board members: Johannes Lehmann, Guy Reinaud, Robert Brown, Tom Miles, Saran Sohi, Annette Cowie, and Kathleen Draper and from Stephen Joseph, Albert Bates. David Wayne and Jessica Shepherd assisted with the presentations. Workshop attendees visited NJAU biochar test plots where rice is grown with three treatments: control, Biochar + NPK fertilizer, and biochar compound fertilizer.



Rotary pyrolysis technology by [Jiangsu Huarui. Co. Ltd.](#) was viewed at the Nanjing Shen Rong straw Technology Co. Ltd. which makes granulated biochar compound fertilizer. Participants also visited the new IBI Asian Center at NJAU.

NJAU continued a four-day China/ASEAN Technology Training on Biochar and Sustainable Agriculture. The workshop included lectures on biochar science, including the UNEP Global Environment Facility project, [Biochar for Sustainable Soils](#) (B4SS), biochar for environmental management and pollution control. Production technologies including straw and other wastes were described by Jiangsu Huadian Environmental Equip. Co Ltd, Jiangsu Huarui Electro Machinery Co Ltd., Tianyuan Environm Machinery Co Ltd and Benenv Co. Ltd. Participants visited a biowaste carbonization plant in Jinhua, Zhejiang Province, built by Zhejiang Jinguo Furnace Co Ltd.

### **3rd Asian Pacific Biomass Conference Re-cap**

The 3rd Asia Pacific Biochar Conference 2016 (APBC 2016): A Shifting Paradigm towards Advanced Materials and Energy/Environment Research was held on October 19 - 23, 2016 at Kangwon National University in Chuncheon, Korea. Ron Larson attended the Conference on behalf of the Biochar Journal and has posted his early [impressions](#) of the conference. Further analysis and reporting from the conference will be forthcoming in the Biochar Journal.

### **IBI responds to "*Current economic obstacles to biochar use in agriculture and climate change mitigation*", an article in the magazine Carbon Management in September 2016**

The study claims to review various biochar attributes and the economic viability of biochar. The call for caution against a blanket recommendation to utilize biochar without consideration of its environmental and economic viability is greatly appreciated. The questions raised are sound, and several caveats on enthusiastic projections of a global biochar industry and a universal benefit to crop yields are well founded. While the authors made a credible attempt in collecting published literature on biochar, their data assemblages are suffering from a simplistic view of how farmers or other stakeholders in a biochar industry would optimize performance of biochar.

The main points that the article presents data compilations for are:

1. Crop yield increases as a result of biochar are low.
2. Persistence of biochar is low.
3. Economic viability is not demonstrated.

### **Crop yield**

The average yield increase with most soil management indiscriminately applied globally will show highly variable and for some possibly very little if any benefit. As an example, many biochars have high pH. Such biochars applied to a calcareous soil will most likely rather decrease crop yields, which does not surprise most farmers. Since much of biochar research has been and unfortunately still is done with little explicit formulation of its anticipated effect to change specific soil or crop processes, the results of the global research effort rather resembles a shot in the dark than a focused research strategy. The disaggregation of current datasets then may serve for identifying avenues where biochar shows promise and where not,- while its average is utterly meaningless. The scientifically much more rigorous meta analyses done elsewhere provide insight in understanding drivers of crop yield changes which an average cannot.

A similarly flawed conclusion could be reached by adding irrigation to any soil world-wide and attempting to conclude from the average global response whether adding water to soil increases crop yield. In some regions, adding water will have great benefits, in others less, in yet others it may even decrease crop yield. Obviously, one wants to assess where water increases crop yield, and further, where it is economically viable to justify the investment in irrigation systems. A global average would probably lead to the conclusion that irrigation is not effective on a global scale, whereas a more nuanced analysis would identify where irrigation can be beneficial. The same point can be made for biochar or any other soil management.

### **Persistence of biochar**

Much has been written about it, and it therefore suffices to consult the relevant literature to identify the misconception that the article propagates. It is undoubtedly correct that thermochemically converted biomass can have a range of different persistence, depending on how it was made, from what it is made, and what environmental conditions it is exposed to. The same crop residue exposed to a humid tropical environment will mineralize much quicker than that exposed to Arctic climates. Similarly, biochar made at 300C from poultry manure will have a very short half-life, whereas that made from woody material at 600C will have a very long half-life. Averaging these values glosses over the known variation in properties that are already used to predict differences in biochar mineralization. It also glosses over the fact that some users of biochar products may add it to soil to address certain soil fertility constraints and may not even be interested in the persistence of the material, for example when short-term nutrient or liming benefits are of interest. In a climate mitigation context, however, the persistence of biochar is certainly of great interest, and there is no ambiguity that biochars can be produced that have 1-2 orders of magnitude lower mineralization than the uncharred biomass, if persistence is of interest.

### **Economic viability**

There is indeed only a nascent biochar industry at best. And crop yield increases of major cereal crops will likely be the last ones to justify biochar additions on mostly already very productive soils. Focusing solely on the lowest value crops is understandably a result of the more abundant data available for cereal crops. The economic analysis of the large variety of biochar systems, however, deserves a much more nuanced analysis than this article is able to contribute.

### **The IBI Online Biochar Training Course is Ongoing**

Gain in-depth knowledge on biochar and biochar systems. Register for IBI's online course, Biochar Training for Environmental Sustainability and Economic Development. This ten week, ongoing course provides participants an intensive training series on all aspects of biochar, presented by leading biochar experts. Learn about best-science updates on biochar, biochar production and use, how to overcome the barriers to commercialization. 19 separate lessons-each with a subject overview, a recorded audio/video presentation lasting 30 - 45 minutes and quizzes to test comprehension and retention. An optional introductory presentation on the basics of biochar allows participants to start the course with a common understanding. Course materials are presented in a user-friendly online format. Participants can access the course at their convenience over ten weeks and will receive a certificate of completion at the conclusion of the course.

Course materials are based on presentations from the June 2014 in-person biochar training course titled, "Biochar for Environmental Sustainability and Economic Development," hosted by the University of Santiago de Compostela, Spain, and developed and presented by IBI and collaborators. For more information on member and non-member pricing and registration, please see: [www.biochar-international.org/online\\_course](http://www.biochar-international.org/online_course)

## Upcoming Calendar Events

- 22nd session of the Conference of the Parties ([COP 22](#)) to the UNFCCC, November 7-18, 2016; Marrakech, Morocco
- 2016 International Annual Meeting of the American Society of Agronomy, Crop Science Society of America, and Soil Science Society of America, "[Resilience Emerging from Scarcity and Abundance](#)," on Nov. 6-9, 2016, in Phoenix, AZ
- [ICSSM 2017](#) : 19th International Conference on Soil Science and Management, Durban, South Africa, January 12 - 13, 2017
- [Ecological Farming Association \(EcoFarm\) conference](#), Cultivating Diversity Jan 25-28, 2017, Pacific Grove, CA @Eco\_Farm
- [Guelph Organic Conference](#) January 26-19,217, Guelph University Center, Guelph Ontario, Canada @GuelphOrganic
- 1<sup>st</sup> International Conference on Climate Change 2017 ([ICCC 2017](#)), February 16 -17, 2017 in Colombo, Sri Lanka under the theme "*Climate Change, Facing the challenge beyond COP21*"; NOTE: Abstracts being accepted through December 15, 2016

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) .

## Recently Published Biochar Research and Resources

"MAKING BIOCHAR - WITH TECHNICAL MANUAL" By Brian Lewis; The book is available to purchase for \$9.99 direct from [www.strongandbold.com](http://www.strongandbold.com).

Dominic Woolf, Johannes Lehmann, David R. Lee. **Optimal bioenergy power generation for climate change mitigation with or without carbon sequestration.** *Nature Communications*, 2016; 7: 13160 DOI: [10.1038/ncomms13160](https://doi.org/10.1038/ncomms13160) (See IBI's press release on this [here](#))

The Biochar Journal, by Ithaka Institute, [www.biochar-journal.org/en](http://www.biochar-journal.org/en) @BiocharJournal

If you have published work that is not included, please email us.

### Published in ISI journals in October 2016:

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J Cai, WF, Liu, RH, Performance of a commercial-scale biomass fast pyrolysis plant for bio-oil production, FUEL, Oct 15, 2016, 182, 677 - 686, 10.1016/j.fuel.2016.06.030

Soysa, R, Choi, YS, Kim, SJ, Choi, SK, Fast pyrolysis characteristics and kinetic study of Ceylon tea waste, INTERNATIONAL JOURNAL OF HYDROGEN ENERGY, Oct 5, 2016, 41, 37, SI, 16436 - 16443, 10.1016/j.ijhydene.2016.04.006

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DeVallance, DB., Oporto, GS., Quigley, P.; Investigation of hardwood biochar as a replacement for wood flour in wood-polypropylene composites, JOURNAL OF ELASTOMERS AND PLASTICS, Oct 2016, 510 - 522, 10.1177/0095244315589655

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Brassard, P., Godbout, S., Raghavan, V.; Soil biochar amendment as a climate change mitigation tool: Key parameters and mechanisms involved; JOURNAL OF ENVIRONMENTAL MANAGEMENT; Oct 1, 2016, p 484 - 497, 10.1016/j.jenvman.2016.06.063

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Yang, G., Sun, Y., Zhang, JP., Wen, C., Fast carbonization using fluidized bed for biochar production from reed black liquor: optimization for H2S removal; ENVIRONMENTAL TECHNOLOGY; Oct 2016, p 2447 - 2456, 10.1080/09593330.2016.1151463

### Connect with IBI Members and Supporters

A listing of all current IBI [Business](#) and [Organization](#) Members can be found on our website. For more information on membership opportunities and benefits, 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.

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