June 2017 News from the International Biochar Initiative

Calls for Book Chapters and Journal Papers

Nova Science Publishers has issued a call for chapters of a new post-graduate level book on **Non-soil biochar applications,** to be published March 2018. Chapters should be 6,000-10,000 words with high quality figures/graphs and are due by October 2017. Example topics include, but are not limited to:

- Application of biochar in building materials
- Application of biochar in potable water and wastewater treatment
- Biochar application in storm water management
- Biochar as a filter for managing air quality
- Biochar as a catalyst for chemical reactions
- Biochar use for gaseous emissions control/storage
- Biochar in fuel cell systems
- Development of biochar-based supercapacitors
- Application in animal husbandry

Contact any of these editors for more information:

- Dimitrios Kalderis, Asst. Professor, Department of Environmental and Natural Resources Engineering, School of Applied Sciences, Technological and Educational Institute of Crete, GREECE – dkalderis@chania.teicrete.gr
- Dimitrios Ntarlagiannis, Asc. Researcher Professor, Department of Earth & Environmental Sciences, Rutgers University, NJ, USA - dimntar@rutgers.edu
- Pantelis Soupios, Professor, Department of Environmental and Natural Resources Engineering, School of Applied Sciences, Technological and Educational Institute of Crete, GREECE - soupios@staff.teicrete.gr

Nutrient Cycling in Agroecosystems has a final call out for submissions to a *Special Edition* on **The Longer-Term Role of Organic Amendments in Addressing Soil Constraints to Production**, edited by Lukas Van Zwieten and Johannes Lehmann.

This special edition will bring together high quality research from longer-term field studies testing the role of organic amendments such as compost, manures, mulch and biochar on soil fertility and soil constraints, functionality, and interactions with native C and mineralogy. Risks associated with these amendments should be considered, particularly impacts on soil GHG emissions, physical contaminants, organic and inorganic contamination, and economics.

In addition to the regular Journal requirements, this Special Edition also seeks studies that:

- have clearly identified mechanism-driven hypotheses,
- use biometrically designed trials with statistics that have been internally reviewed before submission of the manuscript,
- where possible, use stable isotopic methodologies to unravel mechanisms,
- have fully characterized and classified soils,
- use well-characterized organic amendments. This includes; origin of feedstock, production conditions, and relevant chemical, biological and physical characterization of the materials applied in the field.

Submissions are due July 31. For more information, please contact Lukas at:
lukas.van.zwieten@dpi.nsw.gov.au

Biochar related jobs, scholarships or volunteer opportunities

3 PhD candidates are sought to examine century-old charcoal kiln sites for assessing long term biochar effects on agronomical and environmental performance of agricultural soils by Liège University, Belgium. The positions are fully funded for 4 years, starting on 1st October 2017. Letters of interest accepted through July 1, 2017.

Sales and Marketing Executive at Advanced Biochar Products, State College, PA, USA. Travel outside PA required.

Postdoctoral Research Associate in Soil Carbon Dynamics for Greenhouse Gas Removals, University of Edinburgh, Edinburgh, Scotland. Applications accepted through July 13, 2017.

Researcher on an interdisciplinary project dealing, among other subjects, with the study of biochar as possible soil amendment in viticultural systems, Libera Università di Bolzano, Roma, IT. Applications accepted through July 17, 2017.

Mechanical/Chemical Project Engineer at Haliburton Forest Biochar Ltd., Haliburton, ON, Canada

IBI Volunteer Opportunity: Fundraiser on the IBI Board of Directors
IBI is looking to appoint an experienced Board Member at Large that is interested in spearheading IBI's Fundraising efforts. This person should have experience with identifying and obtaining grants related to agriculture, renewable energy and/or climate change on behalf of either non-profit or academic institutions. No geographic preference is required, although a very strong capability in verbal and written English is necessary. For those interested, please send a letter of interest as well as an outline of relevant experience to info@biochar-international.org.

Biochar Webinar Series

Thank you to our June Webinar presenter, Mattius Gustoffson, project manager for the Stockholm Biochar Project, who provided an overview of the experiences, lessons learned and economics in implementing the world's first pilot plant dedicated to carbonizing urban greenwaste. The video recording will be available to all IBI members on the IBI members only page soon.

Previous webinars are accessible to IBI members for **free** via the Members Only page a few days after the Webinars take place. Non-members that would like to view previous 2017 webinars, may pay a one-time fee of $40. Further information is available on our Webinars Series page.

New and renewing organizational & business member spotlight

Note: bios below were provided by members (or from websites) and not written by IBI

New organizational member: **Center of Biomass and Biochar Green Technology, Nanjing Agricultural University**:

Center of Biomass and Biochar Green Technology, Nanjing Agricultural University, was a successor of the former "Center of Biochar for Green Agriculture", established in March 2016 following cooperation projects on "Biowastes to Biochar for Bioeconomy" with Chinese business. The vision of the center is to provide green solutions for biowastes treatment and sustainable soil and environment management. The mission is to develop novel technologies for green (safe, low-emission and high recovery) conversion of biowastes into biochar and related products for use in agriculture, green city and environmental management. The activities of center covers technology innovation, technology transfer to industry and technical training of professionals for a greener economy in agriculture and beyond. The center hosts the Asian Center of the International Biochar Initiative (IBI). Affiliated to the center are a number of Chinese key corporations with biomass and biochar for bioenergy, fertilizers and soil conditioner. Professor Pan is now acting as a leader in science, technology and education of the center.

New organizational member: **The Jinhua Institute of Bioeconomy Technology:**

As an outreach of the "Center of Biomass and Biochar Green Technology, Nanjing Agricultural University", the institute was founded in 2016 under the joint authority of Jinhua Municipality and the university. The institute aims to develop novel technologies to convert biowastes into green resources for use in agriculture, green city and land reclamation for developing bioeconomy in the region. The institute is in close cooperation with local business companies, innovating novel solutions for green conversion of livestock manure, sewage sludge and municipal biowastes, including pyrolysis systems for recycling energy, nutrients and organic matter for use in the green sector (city farming, green landscape and suburban agriculture). Professor Pan is currently acting as a chief scientist of the institute.

Regional Updates

South America: Grupo Alimenta, in Peru, has built an integrated algae (spirulina), biochar, fertilizer production system based on a pyrolizer designed by Professor Stephen Joseph and Russell Burnett of BES Ltd in Australia (based on open source technology out of Johannes Lehmann's group at Cornell University). Modifications to the design and detailed design of the heat exchanger were carried out by Peruvian engineers Samuel Encarnación and Yngrid Espinoza. Vasco Masias and Felix Froese were also key collaborators. The system chars 100 kg/hr of dry feedstock and biochar products will be trialed initially on the Peruvian coast and the central Amazon river basin.

Australia has awarded the honour of Member in the Order of Australia to Dr. Stephen Joseph "for significant service to science through research and developments in biochar engineering and renewable energy, and to the community." Professor Joseph was a Founding Vice-Chairman of IBI and serves currently on the Advisory Committee. He is also a Committee Member of the Australian and New Zealand Biochar Researchers Network.

On a small farm in western Australia, Karry Fisher-Watts is using biochar to desalinate soil for crops.

Europe: The startup project APSU was recognized by the European Parliament as the best project of a startup in the category of water. APSU's prototype uses a derivative of an Asian microwave technology to treat contaminated water and turn contaminants into biochar. The APSU team hopes to base production of their water purification system in The Canary Islands.

Companies in Switzerland and Germany have made outhouses chic in order to collect valuable humanure for composting and biochar feedstock.

Coaltec Energy is designing a manure gasification plant to be built near St. Petersburg, Russia.

North America: A waste management firm in Edmonton, Ontario, Canada, partnering with the Northern Alberta Institute of Technology, is production testing a system to convert waste wood pallets and other materials to biochar as a means to reduce tipping fees, earn carbon credits, and increase revenue.

Five years of research at Cape Bretton University, Nova Scotia, Canada is proving biochar to be a cost-saving replacement for activated charcoal in applications including water filtration, cleansers, and cosmetics.

The Caribbean: Caritas Switzerland and Concertation et Action pour le Développement are jointly implementing a €1.2 million project to reduce the vulnerability of the local population to the disruptions caused by climate change in Léogâne, Haiti (the epicenter of the 2010 earthquake). One of the planned actions includes the use of biochar among the commune's 12,500 families.

Asia: Two pre-college students from Sri Lanka, Shehan Kavishka and Sankalpa Perera, won a 4th place Grand Award at the 2017 Intel International Science and Engineering Fair (ISEF) for their project on "Micro and nano engineering for wastewater: magnetized biochar and nanoparticle composite for toxic Cr (VI) removal."

A fundraiser is underway to reduce smoke pollution from field burning in Northern Thailand with Warm Heart Worldwide's biochar training program.

Upcoming Calendar Events

- Alpine hike of two days to discover the ancient origins of the carbon in the soils of Pejo and its impact on alpine meadows and high-altitude laricete. July 8 – 9, 2017, Stelvio National Park, Cogolo Pejo, Italy.

- Appalachian Biochar Innovation Conference, July 14, 2017, Eastern West Virginia Community and Technical College, Moorefield, West Virginia

- BIOCHAR AND SLOW-SAND BIOFILTRATION FOR POTABLE WATER - 3 DAY INTENSIVE - AUGUST 1-3, 2017. Location: San Miguel de Allende, Mexico. Tuition: $500. In this 3-day intensive course, participants will delve into theory and practical application of biochar adsorption for organic chemical contaminants – a growing concern in developing communities around the globe – and slow-sand filtration for biological water contaminants – the leading cause of water related illness and death in the world. Students will produce and process biochar and sand filtration media and install a full-scale 300 liter/day integrated treatment system in a local community. The course is presented by Caminos de Agua (caminosdeagua.org) and Aqueous Solutions (aqsolutions.org).
- Australia New Zealand Biochar Conference August 10 – 12, 2017, Tweed, Australia. The aims and objectives of ANZBC17 are to bring together Scientists & Growers to bridge the gap between fundamental science, applied science & commercial applications, to unite the various Biochar

groups from each State in Australia & New Zealand, to showcase the very latest technology to match the biomass source, value added bio-products, methods of applications and scientific results and commercial trial methods and results. Conference themes include: Technology & Production for matching sustainable biomass sources; Value added Bio-Products; Applied Science (Discoveries & Results); Commercial Applications (Methods & Results). Additional info can be found here and here

- Biochar Field Tour / Open House August 11, 2017, Bayfield, ON, Canada. Learn how biochar influences soil health. Registration deadline: July 20. Uwsoilbiochar@gmail.com
- Biochar: Production, Characterization & Applications, Alba, Italy, Hotel Calissano, **August 20-25,** 2017
- International Symposium on Growing Media, Soilless Cultivation, and Compost Utilization in Horticulture, **August 20-25**, in Portland OR. Attendees are welcome to submit abstracts and requests to give talks/presentations (or posters) during the meeting as well if desired.
- 2nd Annual Conference of the Biochar Initiative of Nigeria, 11 - 15 September 2017. University of Ibadan, Ibadan, 200284, Nigeria
- 2nd Second Global Soil Biodiversity Conference, October 15-19, 2017, Nanjing, China. Topic 15 is the *Biochar for soil biota and biodiversity* session. Session contact for abstract questions is: Dr. Genxing Pan. Email: pangenxing@aliyun.com; gxpan1@hotmail.com
- Annual meeting of the Tri-Societies – Agronomy Society of America -- Crop Science Society -- Soil Science Society of America (ASA-CSSA-SSSA) with more than 4,000 scientists, professionals, educators, and students in Tampa, Florida, on Oct. 22-25, 2017 has the theme "Managing Global Resources for a Secure Future," as well as the annual "show me the science" gathering of the ASA Biochar Community members.
- The 2nd **China- Asian Biochar Workshop** is scheduled to take place during November 18-21, 2017. The theme of the workshop will be **Biochar Production and Application for Green Agriculture-from Technology to Viable Systems.** The workshop is aimed to enhance a joint exchange and sharing of the biochar developments between China and Asian countries and beyond, and an access to novel biochar technologies and viable systems for safe recycling of biowastes for green development. The venue of this workshop will be in **Wanda Hotel** in **Jinhua Municipality,** Zhejiang Province, China, which is a green city with a fast growing bioeconomy. Further details on the workshop can be found here.
- 8th International Conference on Biofuels, Bioenergy & Bioeconomy, Dec 4 – 5, 2017, Sao Paulo, Brazil. Presentations from more than 30 countries and 100 organizations.

See the IBI Calendar page for more events. To add an event to the calendar, email the information to the IBI newsletter editor, Robert W. Gillett.

A Selection of Recently Published Biochar Research and Resources

Citations are from last month's new 'biochar' entries in the ISI Web of Science Core Collection

Dougherty, B., M. Gray, M.G. Johnson, and M. Kleber. Can Biochar Covers Reduce **Emissions from Manure Lagoons** While Capturing Nutrients? JOURNAL OF ENVIRONMENTAL QUALITY 2017 46(3) 659–666

Huang, JF; Shi, QS; Feng, J; Chen, MJ; Li, WR; Li, LQ Facile pyrolysis preparation of rosin-derived **biochar for supporting silver nanoparticles with antibacterial activity** COMPOSITES SCIENCE AND TECHNOLOGY 2017 145 89-95

Dong, HR; Deng, JM; Xie, YK; Zhang, C; Jiang, Z; Cheng, YJ; Hou, KJ; Zeng, GM Stabilization of nanoscale zero-valent iron (nZVI) with **modified biochar for Cr(VI) removal from aqueous solution** JOURNAL OF HAZARDOUS MATERIALS 2017 332 79-86

Liu, ZL; Dugan, B; Masiello, CA; Gonnermann, HM Biochar particle size, shape, and porosity act together to influence **soil water properties** PLOS ONE 2017 12

Eizenberg, H; Plakhine, D; Ziadne, H; Tsechansky, L; Graber, ER Non-chemical **Control of Root Parasitic Weeds** with Biochar FRONTIERS IN PLANT SCIENCE 2017 8

Ali, A; Guo, D; Zhang, Y; Sun, XN; Jiang, SC; Guo, ZY; Huang, H; Liang, W; Li, RH; Zhang, ZQ Using bamboo biochar with compost for the **stabilization and phytotoxicity reduction of heavy metals** in mine-contaminated soils of China SCIENTIFIC REPORTS 2017 7

Berihun, T; Tadele, M; Kebede, F The application of biochar on **soil acidity and other physico-chemical properties** of soils in southern Ethiopia JOURNAL OF PLANT NUTRITION AND SOIL SCIENCE 2017 180-381 388

Linville, JL; Shen, YW; Ignacio-de Leon, PA; Schoene, RP; Urgun-Demirtas, M In-situ biogas upgrading during **anaerobic digestion** of food waste amended with walnut shell biochar at bench scale WASTE MANAGEMENT & RESEARCH 2017 35 669-679

Cui, EP; Wu, Y; Jiao, YA; Zuo, YR; Rensing, C; Chen, H The behavior **of antibiotic resistance genes and arsenic** influenced by biochar during different manure composting ENVIRONMENTAL SCIENCE AND POLLUTION RESEARCH 2017 24 14484-14490

Wang, H; Xia, W; Lu, P Study on adsorption characteristics of biochar on **heavy metals in soil** KOREAN JOURNAL OF CHEMICAL ENGINEERING 2017 34 1867-1873

Yousaf, B; Liu, G; Wang, R; Abbas, Q; Imtiaz, M; Liu, R Investigating the biochar effects **on C-mineralization and sequestration of carbon in soil compared with conventional amendments** using the stable isotope (delta C-13) approach GLOBAL CHANGE BIOLOGY BIOENERGY 2017 9 1085-1099

Cheng, HG; Hill, PW; Bastami, MS; Jones, DL Biochar **stimulates the decomposition of simple organic matter and suppresses the decomposition of complex organic matter** in a sandy loam soil GLOBAL CHANGE BIOLOGY BIOENERGY 2017 9 1110-1121

Yang, F; Lee, XQ; Theng, BKG; Wang, B; Cheng, JZ; Wang, QA Effect of biochar addition on short-term **N_2O and CO_2 emissions** during repeated drying and wetting of an anthropogenic alluvial soil ENVIRONMENTAL GEOCHEMISTRY AND HEALTH 2017 39 635-647

Kanjanarong, J; Giri, BS; Jaisi, DP; Oliveira, FR; Boonsawang, P; Chaiprapat, S; Singh, RS; Balakrishna, A; Khanal, SK **Removal of hydrogen sulfide generated during anaerobic treatment of sulfate-laden wastewater** using biochar: Evaluation of efficiency and mechanisms BIORESOURCE TECHNOLOGY 2017 234 115-121

Wang, B; Jiang, YS; Li, FY; Yang, DY Preparation of biochar by **simultaneous carbonization, magnetization and activation for norfloxacin removal** in water BIORESOURCE TECHNOLOGY 2017 233 159-165

Yakout, SM **Physicochemical Characteristics of Biochar Produced from Rice Straw** at Different Pyrolysis Temperature for Soil Amendment and Removal of Organics PROCEEDINGS OF THE NATIONAL ACADEMY OF SCIENCES INDIA SECTION A-PHYSICAL SCIENCES 2017 87 207-214

Al Marzooqi, F; Yousef, LF **Biological response of a sandy soil treated with biochar derived from a halophyte** (Salicornia bigelovii) APPLIED SOIL ECOLOGY 2017 114 9-15

Khadem, A; Raiesi, F Responses of microbial performance and community to **corn biochar in calcareous sandy and clayey soils** APPLIED SOIL ECOLOGY 2017 114 16-27

Arshad, M; Khan, AHA; Hussain, I; Badar-uz-Zaman; Anees, M; Iqbal, M; Soja, G; Linde, C; Yousaf, S The **reduction of chromium (VI) phytotoxicity and phytoavailability to wheat** (Triticum aestivum L.) using biochar and bacteria APPLIED SOIL ECOLOGY 2017 114 90-98

Lin, Q; Xu, X; Wang, LH; Chen, Q; Fang, J; Shen, XD; Lou, LP; Tian, GM The speciation, leachability and bioaccessibility of **Cu and Zn in animal manure-derived biochar**: effect of feedstock and pyrolysis temperature FRONTIERS OF ENVIRONMENTAL SCIENCE & ENGINEERING 2017 11

Rodriguez-Vila, A; Forjan, R; Guedes, R; Covelo, E **Nutrient phytoavailability in a mine soil** amended with technosol and biochar and vegetated with Brassica juncea JOURNAL OF SOILS AND SEDIMENTS 2017 17 1653-1661

Smebye, AB; Sparrevik, M; Schmidt, HP; Cornelissen, G Life-cycle assessment of biochar production systems in tropical rural areas: **Comparing flame curtain kilns to other production methods** BIOMASS & BIOENERGY 2017 101 35-43

Mertens, J; Germer, J; de Araujo, JC; Sauerborn, J Effect of biochar, clay substrate and manure application on **water availability and tree-seedling performance in a sandy soil** ARCHIVES OF AGRONOMY AND SOIL SCIENCE 2017 63 969-983

Fernandez-Ugalde, O; Gartzia-Bengoetxea, N; Arostegi, J; Moragues, L; Arias-Gonzalez, A Storage and **stability of biochar-derived carbon** and total organic carbon in relation to minerals in an acid forest soil of the Spanish Atlantic area SCIENCE OF THE TOTAL ENVIRONMENT 2017 587 204-213

Wang, Y; Liu, RH Comparison of characteristics of twenty-one types of biochar and their **ability to remove multi-heavy metals and methylene blue** in solution FUEL PROCESSING TECHNOLOGY 2017 160 55-63

Abbas, T; Rizwan, M; Ali, S; Zia-ur-Rehman, M; Qayyum, MF; Abbas, F; Hannan, F; Rinklebe, J; Ok, YS Effect of biochar on **cadmium bioavailability and uptake in wheat** (Triticum aestivum L.) grown in a soil with aged contamination ECOTOXICOLOGY AND ENVIRONMENTAL SAFETY 2017 140 37-47

Deng, B., Tammeorg, P., Luukkanen, O., Helenius, J., Starr, M. (2017). Effects of Acacia seyal and biochar on soil properties and sorghum yield in agroforestry systems in South Sudan. Agroforest Syst (91):137–148. DOI 10.1007/s10457-016-9914-2

IBI Membership Opportunities for Least Developed Country residents

IBI is seeking to expand its membership to include those living in the UN designated Least Developed Countries (LDCs). We are also interested in expanding the information about biochar activities in these 48 countries. As we understand that the IBI membership fee for developing country residents can be a steep barrier to membership, we would like to offer the opportunity of **providing information to IBI about biochar projects or other activities in exchange for an annual membership**. For those interested in more information on this service in exchange for membership opportunity, please send an email to: info@biochar-international.org.

We encourage all those that have yet to renew their membership, to do so now via the IBI website.

Sponsor a member

Would you like to help students, researchers or project developers from the developing world get more connected to the biochar community? Give the gift of IBI membership! We recognize that individuals from certain countries may not be able to afford IBI membership and are seeking ways to provide improved networking and knowledge sharing with this community. For this reason, we would like to facilitate sponsorship for individuals from the developing world to enable them to receive IBI member benefits.

If you are interested in sponsoring the membership fee of an individual from a developing world country OR if you are interested in being sponsored, please contact IBI at info@biochar-international.org.

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

A Note from the (New) Newsletter Editor

It is with pleasure that I have recently accepted responsibility for collecting and editing the information in these monthly newsletters. I look forward to serving the needs of IBI's membership through this small but engrossing task. If there are stories or features you would like to see or suggestions for improvement, feel free to email them to me. I have been passionate about biochar for several years and look forward to getting to know more of you who can share your hopes, discoveries, and accomplishments surrounding this marvelous material and exciting industry.

Sincerely Yours,

Robert W. Gillett, Lusby, Maryland, U.S.A.

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