



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**

November 2016 News from the International Biochar Initiative for Members and Supporters

Support IBI – Join or volunteer today!

Join, renew or donate to support IBI. We encourage all those that have yet to renew their membership, to do so now via the [IBI website](#).

IBI is looking for volunteers to help us grow our organization. We are looking for assistance with membership management and growth, fundraising, updating our website and more. If you have an interest in helping, please send an email to info@biochar-international.org.

Seeking Proposals for Naming as “Global IBI Conference”

IBI is inviting proposals for a global biochar conference to be held in 2017. Organizers of national or regional conferences on biochar can apply to IBI for being named the “2017 Global IBI Conference”. Only one conference is chosen each year. The deadline for proposals is January 1, 2017 with decisions being expected by February 1, 2017. Application details can be found on the IBI website.

Conference Updates

Conference of the Parties (COP) 22

By Albert Bates, author of The Biochar Solution

The 4 per 1000 initiative (the French government's campaign — 4 grams increase of soil carbon per year in every kilogram of farmed earth) remains the best game in town, whether your town is Paris, Marrakech, or in 2017, Bonn. It would, in the French government's theory (supported by IPCC's notion of a "carbon budget" but called into question by the latest report cards from the Tyndall Centre and others) be enough to hold climate change at 1.5 degrees, if universally adopted.

That 2014 COP-20 proposal, “Soil for food security and climate” became part of the “Lima-Paris Action Agenda” and then, two weeks ago at COP-22, the “Global Climate Action Agenda,” but the word 'soil' only made it once into the Marrakech Action Proclamation at the end of COP-22, and that was in reference to the venue being "on African soil." The word 'agriculture' was completely absent.

However, if you read the outcome document liberally to assume the Nationally Determined Contributions (NDC), or the UN's pledge system, constitutes the action agenda at present, then there may still be some hope.

While the 4 per 1000 initiative gained no new additions to the 37 nations that endorsed in Paris, many NDPs are *starting to reflect the realization that putting carbon back in the ground might be a cheap way to meet their goals*. This includes the United States, which last May issued a [“Climate Smart” agriculture and forestry plan](#). The word 'biochar' does not appear in that 60-page plan. Pyrolysis is only mentioned in the context of a way to reduce methane from concentrated farming animal wastes.

The influence of biochar researcher Hans-Peter Schmidt was evident at the margins of COP22, where Swiss biotech company Zaluvida Corporate AG pitched for venture capital from business leaders to support its natural solution to reduce methane emissions in cows, Mootral(TM). Mootral is a feed supplement made from biochar infused with garlic and citric extract.

Just 10 grams a day reduces bovine flatulence 30 percent while increasing weight gain and lactose production. According to the literature handed out by Zaluvida, feeding every cow a daily dose of Mootral would be the same as taking 200 million cars off the road. An antibiotic version is scheduled for release next year after it receives patent approval.

2016 ASA-CSSA-SSSA Biochar Community Presentation Highlights

By Dr. Gilbert C. Sigua, 2017 Chair, ASA Biochar Community

Biochar: Agronomic and Environmental Uses Community is a community of the American Society Agronomy. The Biochar Community met during the 2016 International Meeting of the Tri-societies -- Agronomy Society of America-Crop Science Society-Soil Science Society of America (ASA-CSSA-SSSA) -- held in Phoenix, Arizona on November 6-9, 2016. The Biochar Community featured 30 oral (abstracts available [here](#) and [here](#)) and poster presentations that involved novel and current uses of biochar. This community provides the leadership to fill the need of a scientific network focused on the environmental and agronomic impacts of biochar, and molds future directions of biochars' collaborative investigations. Dr. Gilbert C. Sigua, a Soil Scientist with the U.S. Department of Agriculture - Agricultural Research Service in Florence, SC and the incoming chair of The Biochar Community moderated the 2016 Biochar Community-sponsored technical presentations.

Twelve speakers and 18 [poster presenters](#) during the three-day session covered a variety of topics ranging from impacts of biochar on soil physical and chemical properties (e.g. soil compaction, water retention, water infiltration; sorption of soil nutrients, heavy metals and pesticides; and nutrient cycling and availability) to environmental uses (e.g. runoff abatement, water quality improvement, reducing metal availability in mine soils, reduction in greenhouse gas emissions and enhancing soil carbon sequestration). The oral sessions were well-attended, with an average of 40-50 attendees per session while poster presentations were well-received by the hundreds of attendees interested in the uses of biochars, as well as in soil and environmental productivity and sustainability.

Biochar has been revealed to have valuable effects on soil properties and plant yield in degraded and/or marginal soils, as well as reduction in soil greenhouse gas emissions in other soils. The capability of soil to retain water and optimum fertility levels under drought and other extreme hydrological events due to changing climate is essential to the survival and viability of crops and microbes. Where the rubber meets the roads, biochar is a promising technology for climate mitigation, presenting benefits in terms of carbon sequestration and potentially reducing nitrous oxide emissions. However, further research is needed to illuminate mechanisms behind these observations and to advance guidelines for biochar's utilization. In the years to come, the Biochar Community will continue to facilitate scientific data exchange, spur collaborations and provide a forum to share and extend the impact of biochar by coordinating multi-location research efforts among its members. October 22-25, 2017 is the "Save the Date" for the 2017 annual meeting of ASA-CSSA-SSSA in Tampa, Florida, as well as the annual "show me the science" gathering of the ASA Biochar Community members.

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

Upcoming Calendar Events

- [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 26-19,2017, Guelph University Center, Guelph Ontario, Canada @GuelphOrganic
- [Landscape Heroes: Carbon, Water & Biodiversity](#) January 31, 2017, Amherst, MA
- [BIOCYCLE EAST COAST17](#) Baltimore, MarylandTurf Valley Hotel, April 4, 5, 6, 7, 2017, [Call For Papers Open Now](#)
- [Compost 2017](#) Jan 23027, Los Angeles, CA US Composting Council
- [Biochar: Production, Characterization & Applications](#), Alba, Italy, August 20-25, 2017; [Call for Abstracts](#) Deadline: Feb. 28, 2017

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

Recently Published Biochar Books, Articles, Research and Resources

Biochar: A Regional Supply Chain Approach in View of Climate Change Mitigation. Viktor J. Bruckman, Esin Apaydin Varol, Başak B. Uzun, Jay Liu; Cambridge University Press, Nov 24, 2016 [[eTextbook](#) available now; print copy due out in January]

Farmers learn to make biochar in the Philippines <http://www.sunstar.com.ph/cebu/local-news/2016/11/27/farmers-learn-make-biochar-tech-511863>

Biochar at COP22: Fighting Climate Change From the Ground Up <https://psmag.com/biochar-at-cop22-fighting-climate-change-from-the-ground-up-c3ab90875da7#.uj3v61pd2>

Published in ISI journals in November 2016:

AUTHORS	TITLE	SOURCE
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Wang, Yu-Ying; Lu, Hao-Hao; Liu, Yu-Xue; Yang, Sheng-Mao	Ammonium citrate-modified biochar: An adsorbent for La(III) ions from aqueous solution	COLLOIDS AND SURFACES A-PHYSICOCHEMICAL AND ENGINEERING ASPECTS
Jia, Mingyun; Wang, Fang; Jin, Xin; Song, Yang; Bian, Yongrong; Boughner, Lisa A.; Yang, Xinglun; Gu, Chenggang; Jiang, Xin; Zhao, Qiguo	Metal ion-oxytetracycline interactions on maize straw biochar pyrolyzed at different temperatures	CHEMICAL ENGINEERING JOURNAL
Zheng, Jufeng; Chen, Junhui; Pan, Genxing; Liu, Xiaoyu; Zhang, Xuhui; Li, Lianqing; Sian, Rongjun; Cheng, Kun; JinweiZheng	Biochar decreased microbial metabolic quotient and shifted community composition four years after a single incorporation in a slightly acid rice paddy from southwest China	SCIENCE OF THE TOTAL ENVIRONMENT
Taheran, M.; Naghdi, M.; Brar, S. K.; Knystautas, E. J.; Verma, M.; Ramirez, A. A.; Surampalli, R. Y.; Valero, J. R.	Adsorption study of environmentally relevant concentrations of chlortetracycline on pinewood biochar	SCIENCE OF THE TOTAL ENVIRONMENT
Stefaniuk, Magdalena; Oleszczuk, Patryk; Bartminski, Piotr	Chemical and ecotoxicological evaluation of biochar produced from residues of biogas production	JOURNAL OF HAZARDOUS MATERIALS
Kalinke, Cristiane; Mangrich, Antonio Salvio; Marcolino-Junior, Luiz H.; Bergamini, Marcio F.	Biochar prepared from castor oil cake at different temperatures: A voltammetric study applied for Pb ²⁺ , Cd ²⁺ and Cu ²⁺ ions preconcentration	JOURNAL OF HAZARDOUS MATERIALS
Su, Huijie; Fang, Zhanqiang; Tsang, Pokeung Eric; Zheng, Liuchun; Cheng, Wen; Fang, Jianzhang; Zhao, Dongye	Remediation of hexavalent chromium contaminated soil by biochar-supported zero-valent iron nanoparticles	JOURNAL OF HAZARDOUS MATERIALS
Burrell, Leigh D.; Zehetner, Franz; Rampazzo, Nicola; Wimmer, Bernhard; Soja, Gerhard	Long-term effects of biochar on soil physical properties	GEODERMA
Luo, Xianxiang; Chen, Lei; Zheng, Hao; Chang, Jingjing; Wang, Hefang; Wang, Zhenyu; Xing, Baoshan	Biochar addition reduced net N mineralization of a coastal wetland soil in the Yellow River Delta, China	GEODERMA
Li, Min; Huang, Hongwei; Yu, Shixin; Tian, Na; Dong, Fan; Du, Xin; Zhang, Yihe	Simultaneously promoting charge separation and photoabsorption of BiOX (X = Cl, Br) for efficient visible-light photocatalysis and photosensitization by compositing low-cost biochar	APPLIED SURFACE SCIENCE
Taheran, Mehrdad; Naghdi, Mitra; Brar, Satinder K.; Knystautas, Emile; Verma, Mausam; Surampalli, Rao. Y.; Valero, Jose. R.	Development of adsorptive membranes by confinement of activated biochar into electrospun nanofibers	BEILSTEIN JOURNAL OF NANOTECHNOLOGY
Dalahmeh, S. S.; Lalander, C.; Pell, M.; Vinneras, B.; Jonsson, H.	Quality of greywater treated in biochar filter and risk assessment of gastroenteritis due to household exposure during maintenance and irrigation	JOURNAL OF APPLIED MICROBIOLOGY
Liu, Na; Zhu, Meiling; Wang, Hang; Ma, Huiqiang	Adsorption characteristics of Direct Red 23 from aqueous solution by biochar	JOURNAL OF MOLECULAR LIQUIDS
Li, Qiao; Ding, Wenchuan; Yong, Yi; Zeng, Xiaolan; Gao, Yutao	Effects of Ultraviolet Modification on Physicochemical Property and Adsorption Performance of Biochar	NANOSCIENCE AND NANOTECHNOLOGY LETTERS
Sanchez-Garcia, M.; Sanchez-Monedero, M. A.; Roig, A.; Lopez-Cano, I.; Moreno, B.; Benitez, E.; Cayuela, M. L.	Compost vs biochar amendment: a two-year field study evaluating soil C build-up and N dynamics in an organically managed olive crop	PLANT AND SOIL
Zwetsloot, Marie J.; Lehmann, Johannes; Bauerle, Taryn; Vanek, Steven; Hestrin, Rachel; Nigussie, Abebe	Phosphorus availability from bone char in a P-fixing soil influenced by root-mycorrhizae-biochar interactions	PLANT AND SOIL

Li, Jing; Dai, Jianjun; Liu, Guangqing; Zhang, Hedong; Gao, Zuopeng; Fu, Jie; He, Yanfeng; Huang, Yan	Biochar from microwave pyrolysis of biomass: A review	BIOMASS & BIOENERGY
Lyu, Honghong; He, Yuhe; Tang, Jingchun; Hecker, Markus; Liu, Qinglong; Jones, Paul D.; Codling, Garry; Giesy, John P.	Effect of pyrolysis temperature on potential toxicity of biochar if applied to the environment	ENVIRONMENTAL POLLUTION
Stefaniuk, Magdalena; Oleszczuk, Patryk	Addition of biochar to sewage sludge decreases freely dissolved PAHs content and toxicity of sewage sludge-amended soil	ENVIRONMENTAL POLLUTION
Syed, Rashad; Saggar, Surinder; Tate, Kevin; Rehm, Bernd H. A.	Assessment of farm soil, biochar, compost and weathered pine mulch to mitigate methane emissions	APPLIED MICROBIOLOGY AND BIOTECHNOLOGY
De Tender, Caroline A.; Debode, Jane; Vandecasteele, Bart; D'Hose, Tommy; Cremelie, Pieter; Haegeman, Annelies; Ruttink, Tom; Dawyndt, Peter; Maes, Martine	Biological, physicochemical and plant health responses in lettuce and strawberry in soil or peat amended with biochar	APPLIED SOIL ECOLOGY
Ebrahimi, Negin; Viaene, Nicole; Vandecasteele, Bart; D'Hose, Tommy; Debode, Jane; Cremelie, Pieter; De Tender, Caroline; Moens, Maurice	Traditional and new soil amendments reduce survival and reproduction of potato cyst nematodes, except for biochar	APPLIED SOIL ECOLOGY
Bera, T.; Collins, H. P.; Alva, A. K.; Purakayastha, T. J.; Patra, A. K.	Biochar and manure effluent effects on soil biochemical properties under corn production	APPLIED SOIL ECOLOGY
Yue, Yan; Lin, Qimei; Irfan, Muhammad; Chen, Qun; Zhao, Xiaorong	Characteristics and potential values of bio-oil, syngas and biochar derived from <i>Salsola collina</i> Pall. in a fixed bed slow pyrolysis system	BIORESOURCE TECHNOLOGY
Jung, Kyung-Won; Choi, Brian Hyun; Jeong, Tae-Un; Ahn, Kyu-Hong	Facile synthesis of magnetic biochar/Fe ₃ O ₄ nanocomposites using electro-magnetization technique and its application on the removal of acid orange 7 from aqueous media	BIORESOURCE TECHNOLOGY
Sunyoto, Nimas M. S.; Zhu, Mingming; Zhang, Zhezi; Zhang, Dongke	Effect of biochar addition on hydrogen and methane production in two-phase anaerobic digestion of aqueous carbohydrates food waste	BIORESOURCE TECHNOLOGY
Awasthi, Mukesh Kumar; Wang, Quan; Ren, Xiuna; Zhao, Junchao; Huang, Hui; Awasthi, Sanjeev Kumar; Lahori, Altaf Hussain; Li, Ronghua; Zhou, Lina; Zhang, Zengqiang	Role of biochar amendment in mitigation of nitrogen loss and greenhouse gas emission during sewage sludge composting	BIORESOURCE TECHNOLOGY
Lu, Guan-Yang; Ikeya, Kosuke; Watanabe, Akira	Size distribution of carbon layer planes in biochar from different plant type of feedstock with different heating temperatures	CHEMOSPHERE
Ding, Guanyu; Wang, Buyun; Chen, Lingyu; Zhao, Shuangjiao	Simultaneous adsorption of methyl red and methylene blue onto biochar and an equilibrium modeling at high concentration	CHEMOSPHERE
Rehman, Muhammad Zia-Ur; Rizwan, Muhammad; Ali, Shafaqat; Fatima, Nida; Yousaf, Balal; Naeem, Asif; Sabir, Muhammad; Ahmad, Hamaad Raza; Ok, Yong Sik	Contrasting effects of biochar, compost and farm manure on alleviation of nickel toxicity in maize (<i>Zea mays</i> L.) in relation to plant growth, photosynthesis and metal uptake	ECOTOXICOLOGY AND ENVIRONMENTAL SAFETY

Zha, DW, Li, LF, Pan, YX, He, JB;	Coconut shell carbon nanosheets facilitating electron transfer for highly efficient visible-light-driven photocatalytic hydrogen production from water,	INTERNATIONAL JOURNAL OF HYDROGEN ENERGY,
AM Kumar; Wang, Q; Huang, H; Li, R; Shen, F; Lahori, AH; Wang, P; Guo, D; Guo, Z; Jiang, S; Zhang, Z	Effect of biochar amendment on greenhouse gas emission and bio-availability of heavy metals during sewage sludge co-composting	JOURNAL OF CLEANER PRODUCTION
Shen, Yanwen; Linville, Jessica L.; Ignacio-de Leon, Patricia Anne A.; Schoene, Robin P.; Urgun-Demirtas, Meltem	Towards a sustainable paradigm of waste-to-energy process: Enhanced anaerobic digestion of sludge with woody biochar	JOURNAL OF CLEANER PRODUCTION
Luo, Ling; Gu, Ji-Dong	Alteration of extracellular enzyme activity and microbial abundance by biochar addition: Implication for carbon sequestration in subtropical mangrove sediment	JOURNAL OF ENVIRONMENTAL MANAGEMENT
Nautiyal, Piyushi; Subramanian, K. A.; Dastidar, M. G.	Adsorptive removal of dye using biochar derived from residual algae after in-situ transesterification: Alternate use of waste of biodiesel industry	JOURNAL OF ENVIRONMENTAL MANAGEMENT
Yang, Zhangmei; Fang, Zhanqiang; Tsang, Pokeung Eric; Fang, Jianzhang; Zhao, Dongye	In situ remediation and phytotoxicity assessment of lead-contaminated soil by biochar-supported nHAP	JOURNAL OF ENVIRONMENTAL MANAGEMENT
Mondal, Sandip; Bobde, Kiran; Aikat, Kaustav; Halder, Gopinath	Biosorptive uptake of ibuprofen by steam activated biochar derived from mung bean husk: Equilibrium, kinetics, thermodynamics, modeling and ecotoxicological studies	JOURNAL OF ENVIRONMENTAL MANAGEMENT
Glab, Tomasz; Palmowska, Joanna; Zaleski, Tomasz; Gondek, Krzysztof	Effect of biochar application on soil hydrological properties and physical quality of sandy soil	GEODERMA
Qin, Jiaolong; Cheng, Yuxiao; Sun, Mingxing; Yan, Lili; Shen, Guoqing	Catalytic degradation of the soil fumigant 1,3-dichloropropene in aqueous biochar slurry	SCIENCE OF THE TOTAL ENVIRONMENT
Xu, Gang; Zhang, You; Shao, Hongbo; Sun, Junna	Pyrolysis temperature affects phosphorus transformation in biochar: Chemical fractionation and P-31 NMR analysis	SCIENCE OF THE TOTAL ENVIRONMENT
de Rozari, P.; Greenway, M.; El Hanandeh, A.	Phosphorus removal from secondary sewage and septage using sand media amended with biochar in constructed wetland mesocosms	SCIENCE OF THE TOTAL ENVIRONMENT
Sun, Junna; He, Fuhong; Zhang, Zhenhua; Shao, Hongbo; Xu, Gang	Temperature and moisture responses to carbon mineralization in the biochar-amended saline soil	SCIENCE OF THE TOTAL ENVIRONMENT
Agegnehu, Getachew; Nelson, Paul N.; Bird, Michael I.	The effects of biochar, compost and their mixture and nitrogen fertilizer on yield and nitrogen use efficiency of barley grown on a Nitisol in the highlands of Ethiopia	SCIENCE OF THE TOTAL ENVIRONMENT
Qin, Xiaobo; Li, Yu'e; Wang, Hong; Liu, Chong; Li, Jianling; Wan, Yunfan; Gao, Qingzhu; Fan, Fenliang; Liao, Yulin	Long-term effect of biochar application on yield-scaled greenhouse gas emissions in a rice paddy cropping system: A four-year case study in south China	SCIENCE OF THE TOTAL ENVIRONMENT
Hagner, Marleena; Kempainen, Riitta; Jauhainen, Lauri; Tiilikkala, Kari; Setälä, Heikki	The effects of birch (<i>Betula</i> spp.) biochar and pyrolysis temperature on soil properties and plant growth	SOIL & TILLAGE RESEARCH

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