Highlights from this Month’s News

In this month’s edition, look for news, ideas, and trends like these:
❖ Welcome New Corporate Members
❖ From the Chair
❖ Call for Manuscripts
❖ Calendar
❖ New Research
❖ Seeking Input
❖ Recruitment
❖ Interim appointments

Welcome, New Corporate Members:

Carbofex OY
www.carbofex.fi
Tampere, Finland

Carbofex is the only EBC-certified biochar producer in Northern Europe which ensures a sustainable production process and a superior quality. Carbofex Biochar is pure and of high quality, making it suitable for organic food production.

Genesis BioChar
https://genesisbiochar.com/
Somers, MT, USA

Created from Montana wood waste in a co-generation process that produces electricity for 250 homes, Genesis Biochar is FDA Organic Certified Horticultural Charcoal soil amendment used to condition and build soil. Biochar can endure in soil for thousands of years making it a practical and efficient way to sequester carbon.
Green State Biochar is committed to the reduction of biomass waste and the production of high quality biochar which can be utilized in a myriad of applications including the production of energy.

**Natural Resources Research Institute**
[https://www.nrri.umn.edu](https://www.nrri.umn.edu)
Duluth, MN, USA

NRRI’s mission is to deliver integrated research solutions that value our resources, environment and economy for a sustainable and resilient future. We are a mission-driven, project-focused team working to create opportunities for natural resource stewardship.

… and Renewing Corporate and Organization Members.

**Cummins Inc.**
Minneapolis, MN
[https://www.cummins.com/](https://www.cummins.com/)
Cummins Inc. is a corporation of complementary business segments that design, manufacture, distribute and service a broad portfolio of power solutions. The company’s products range from diesel and natural gas engines to hybrid and electric platforms, as well as powertrain-related technologies, including battery systems, fuel systems, controls, air handling, transmissions, filtration, emission solutions and electrical power generation systems.

**Rainbow Bee Eater Pty Ltd.**
Somers, VIC, Australia
We supply ECHO2 automated continuous biomass to energy and biochar modules that produce low cost biochar and renewable energy from low value biomass residues.

**Simeken Inc.**
Langley, BC, Canada
Design/Engineering/Manufacturing of Pyrolysis Equipment.
Support Biochar!

From the Chair
by Kathleen Draper

By now you have all hopefully heard about the Woka Foundation grant to IBI. Their largesse has already prompted positive progress within IBI with more developments in the planning process. Perhaps most significantly, these funds will allow IBI to hire a few key permanent staff including an Executive Director (ED), a Development Director and a Communications Manager. The job description for an ED is already posted on our [website](#) and we hope you will share this widely amongst your networks. We have also hired a few interim staff to help update the IBI standards and testing protocols, edit our monthly newsletter and begin market research which will facilitate updating our global market survey. You can read more about our new interim staff below.

Earlier this month we hosted a roundtable for sustaining and business members to solicit input on what activities IBI should focus on to best help the biochar industry to scale. If any of our readers have additional thoughts on that, please feel free to send them to us at [info@biochar-international.org](mailto:info@biochar-international.org).

Call for Manuscripts

Associazione Italiana Biochar ICHAR ([www.ichar.org](http://www.ichar.org)) draws attention to a planned Special Issue of the open-access publication 'Agriculture' on the subject: "Long Term Agronomical, Physiological and Environmental Implications of Biochar Use in Agricultural Soils". The deadline for submission of MSs is 31 October 2021. Further information can be found at [https://www.mdpi.com/journal/agriculture/special_issues/Biochar_Agricultural_Soils](https://www.mdpi.com/journal/agriculture/special_issues/Biochar_Agricultural_Soils).

From the website:
This Special Issue is open to contributions (research papers and a reduced number of reviews) exploring the effect of biochar and its blend with other biowaste products (compost, digestate, sludge) on soil fertility and crop yield, posing
particular attention on the interaction among soil, plant and microorganisms occurring in the rhizosphere. In particular, the SI will focus on medium–long term effects of biochar and its blend on:

- Biochar effects on plant ecophysiology and phenology;
- Interaction of biochar with other routes based on the use of biowaste such as composting, anaerobic digestion etc., in order to produce innovative amending media able to increase soil C storage;
- Soil C modelling including, among others, biochar;
- Potential harmful elements (PHEs) and related bioavailability in soils, along with PHEs distribution in plant tissues;
- Biogeochemical soil cycle for nutrients and PHEs as well as physico-chemical and hydrological profiles of biochar amended soils;
- Effects of biochar on phytohormones and other bio-stimulants in the rhizosphere;
- Biochar effects on soil macro e microbiota.

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**In the News**

**The Benefits of Biochar | Architect Magazine** Blaine Brownell on how this carbon-rich soil can reduce our carbon footprint.

**How biochar, ‘agriculture's black gold’, is helping cocoa trees to thrive (confectionerynews.com)** “Agri-business giant Barry Callebout said over the past two years it has run trials in Ghana and Indonesia, and also at various research institutions in Germany and the UK, to test which biochar formulations work most effectively on cocoa and other native tree species found in cocoa growing areas.”

**We can't plant our way out of the climate crisis (fastcompany.com)** In another example in California, some trees are being thinned out in forests to reduce fire risk and then converted into biochar, a material that can be put back in the soil to sequester carbon.

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**Regional Briefs**

**Europe**

- **Trials to suck carbon dioxide from the air to start across the UK | Greenhouse gas emissions | The Guardian** “The trial will be the most comprehensive biochar trial to date and will add 200 tonnes of the material to 12 hectares (29.7 acres) of arable fields and grasslands. The charcoal-like material is produced from wood or organic waste. About 10 tonnes of biochar per hectare can be added to crop fields, but 50 tonnes or more could be buried under grassland. Biochar increases the ability of soil to hold water and nutrients and can help prevent run-off of fertilisers and pesticides.” Prof Cameron Hepburn, at the University of Oxford is leading the coordination of the trials.

- **Nottingham researchers lead £4.5m study on sustainable technology to remove CO2 from the air - East Midlands Business Link** The University of Nottingham is to lead the world’s largest trial to evaluate the viability of a material called biochar to store carbon from the atmosphere to counter the impact of climate change. Professor Colin Snape, Director of the Nottingham’s EPSRC Centre of Doctoral Training in Carbon capture and Storage and Cleaner Fossil Energy is Project Lead.
Mersey Biochar: Carbon Negative Community Energy – Severn Wye, Pure Leapfrog, and PyroCore are excited to announce their recent success in BEIS' Direct Air Capture and Greenhouse Gas Removal Competition to secure funding from the government’s Net Zero Innovation Portfolio to develop our Mersey Biochar technology and approach within the UK.

North America

- Ambitious B.C. project aims to fight climate change one seed at a time | Crosscut Kuperman … “proclaims the forest industry byproduct “black, shiny gold,” because it holds a key to expediting reforestation.”
- Why Grape Growers Are Turning to Biochar for Vine Growth - Growing Produce Phd soil scientist Doug Beck with experience across four continents, on the agricultural perks of terra preta, or the “dark earth.”
- 2021 Wood Innovations Grant Recipients | US Forest Service (usda.gov) 4 biochar projects selected for this years Wood Innovation Grants

Africa


The Biochar Action sheet / A vous d’agir #88, explains what biochar is, how to make and use a simple biochar stove, and how to use the biochar as a soil improver, for filtering water and other applications. More information from pace@tusk.org

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Seeking Input

Reaching climate objectives: the role of carbon dioxide removals (energy-transitions.org) input due by June 30th.

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Recruitment Enquiries

*IBI is Hiring: Executive Director to help us scale the biochar industry. More at: https://biochar-international.org/wp-content/uploads/2021/05/IBI-Executive-Director-Position-Announcement-May-2021.pdf

The Future Forest Company (https://thefutureforestcompany.com/) is interested to recruit an engineer to establish a large-scale biomass pyrolysis plant in Scotland. See the job description and application form at: https://thefutureforestcompany.com/careers/engineer-at-the-future-forest-company/

University of Copenhagen, Denmark calls for applications for the degree of PhD focusing on "Efficient utilization of biochar for water remediation and soil amendment – towards a circular economy." Application deadline June 6, 2021. More at https://euraxess.ec.europa.eu/jobs/617970
The Sustainable Environmental Technology Laboratory (SETL) at Kangwon National University (KNU, Republic of Korea) is currently seeking Ph.D. applicants to start in Fall 2021 or Spring 2022. The student will work on synthesizing biochar-based adsorbents and catalysts for water and wastewater treatments, and resource recovery. More at https://www.aeesp.org/jobs/3810

Research Institute of Organic Agriculture (FiBL), Switzerland is seeking to fund a PhD Student (100%) to study "Effects of biochar on soil quality". More at https://www.fibl.org/en/about-us/career/vacancies/vacancies-fibl-switzerland.html. The application deadline is June 13th, 2021 and the start date is September 1st, 2021 or by agreement.

Welcome New IBI Contributors

Akio Enders has joined IBI as an interim project manager to assist with updating and broadening IBI’s standards and testing methods.

Akio has been motivated to improve the fit between humanity and the natural world for most of his adult life. As an avid horticulturist, Akio’s early focus was green roofs. This led to a Master’s in Agriculture from Cornell University in 2005, after which he became Production Manager for the industry leading nursery, Emory Knoll Farms. When circumstances brought Akio back to Ithaca, NY he started his own green roof plant nursery, only to find that growing the plants was much more rewarding than marketing them, and that being a business owner is perhaps not his calling.

As luck would have it, Professor Johannes Lehmann needed someone to oversee a biochar greenhouse trial, and so began Akio’s 12-year tenure in the Department of Soil and Crop Sciences at Cornell University. From humble beginnings as a Technician who performed bench analyses, Akio was fortunate to be able to nurture his interests and become a Research Support Specialist who designed and fabricated data collection tools and automated research equipment. Notably, Akio was instrumental in the assembly, troubleshooting, commissioning, and operation of the Cornell Pyrolysis Facility.

Over the years, Akio participated in multivarious biochar research ranging from greenhouse and field trials to pyrolysis stoves studies to TEM and synchrotron based spectroscopic investigation of biochar-mineral associations. Akio has collaborated with countless graduate students, post-doctoral associates, and scholars, resulting in over 26 co-authored publications. He was first author of “Characterization of biochars to evaluate recalcitrance and agronomic performance” which was awarded the 2015 Best Paper Award from the journal Bioresource Technology. Additionally, Akio was first author of the chapters “Proximate analyses for characterising biochars” and “Total elemental analysis of metals and nutrients in biochars” in Biochar A Guide to Analytical Methods.

Akio strives to utilize his experience with biochar to enable widespread biochar production and application in real-world settings.

Interim Newsletter Editor:

While our search for a permanent editor continues, John Hofmeyr has been appointed to assist in this capacity.

John has retired from twenty-five years in the industrial chemistry and process engineering industries and ten in the business of electricity and
water distribution hardware. For the past fifteen years, he has been involved in biochar – his little contribution to saving the world. Some of his techno-commercial work is published on the ResearchGate web site.

John's interest in surface chemistry began in the early 1980s, based on (a) the marketing of Union Carbide's non-ionic surfactants into non-detergent applications (notably ore dressing) and (b) providing molecular sieves to replace activated alumina in the drying of a 'witches' brew' of gases from Fischer-Tropsch synthesis at Sasol. That interest revived in the early 2000s when he was GM of a charcoal factory and sought markets other than solid fuels and metallurgical reductants.

Although John has no experience as an editor, he is a 'wannabe' author. His debut novella will be published shortly, a light-hearted quasi-educational work titled From Barter to Bitcoin – the crazy evolution of money. It could be subtitled '... economics for teenagers and up.'

John lives quietly in Johannesburg, South Africa. He holds Life Membership of the South African Chemical Institute.

IBI Welcomes Two Interns:

Nithan Das has joined IBI as a market research intern for Asia:

Hello, I am Nithin, a final year student at the National University of Singapore (NUS) pursuing my concurrent Masters in Project Management (Finance Specialisation) in NUS. During the previous semester, my interest for materials and biochar was sparked after taking a module with Prof Kua from NUS. I enjoyed learning more about the various materials and went to read up more about biochar during the module. That was when my interest was sparked and I am thankful to be given this opportunity to join the prestigious International Biochar Initiative as a market research intern representing the Asia region. I look forward to learn from everyone and hope to contribute my valuable inputs as well. Looking forward to a great 3 months ahead.

Camila Aquije has joined IBI as a market research intern for the Americas:

My name is Camila Aquije and I recently finished an undergraduate degree in Environmental Science at the Universidad Cientifica del Sur (UCSUR) in Lima, Peru. Two years ago, I took a course in which I had the opportunity to learn about biochar and from there, I developed a strong interest in the subject. With the help of professor Brenton Ladd, I developed a thesis project focused on biochar as a climate change mitigation option. Through the thesis research, I have had the good fortune to expand my knowledge of biochar, meet great researchers and have become aware of the important work of the International Biochar Initiative. I am very grateful for this opportunity and I look forward to helping the IBI achieve its goals over the next three months.
New Research

Here are some papers written by IBI members selected from around 250 articles included in the latest monthly lists available on your IBI Members Only Home page. These are compiled by Abhilasha Tripathi to bring you the technical side of the biochar news. If you really want to know what is in the works, exploring this list every month will paint a much fuller picture than you get by just reading this newsletter. You can receive the full research paper list by e-mail every month by joining IBI.

❖ **Review: Biochar and Nitrogen Dynamics in Soil**


From the Abstract: “Previous studies in the literature have shown contradictory results with a noticeable significant effect of biochar toward stimulating available N inputs and reducing its losses under short-term laboratory experimentations. However, long-term field investigations have indicated minimal or negative effects in this regard. Furthermore, some of the experimentations lack appropriate controls or fail to account for inputs or losses associated with biochar particles. It is thus of great importance to contextualise lab-scale experimentations based on real field data to provide a holistic approach for understanding the complicated reactions responsible for modulating N cycle in the charosphere.”

Graphical abstract

Photos by Unknown photographers licensed under CC BY-SA
Response of spinach to various biochars, saline condition
Soothar et al.: The response of spinach (Spinacia oleracea L.) physiological characteristics to different biochar treatments under saline condition Researchgate.Net.
URL: https://bit.ly/3ymkSqz

From the Abstract: "TN in spinach was lower in WB3 (Wood Biochar @ 45 g/kg) than CK. In contrast, TP uptake was enhanced by 93.8% in WB3 compared to CK. Moreover, biochar addition decreased soil pH and increased soil electrical conductivity (EC), TP and TN increased by 317.4 and 34.5%, respectively in biochar treated soil."

Biochar with anaerobic digestion
Song, J, Y Wang, S Zhang, Y Song, S Xue, ... L Liu - ... and Sustainable Energy, (2021) "Coupling Biochar with Anaerobic Digestion in a Circular Economy Perspective: A Promising Way to Promote Sustainable Energy, Environment and Agriculture development in China." Elsevier.
URL: https://www.sciencedirect.com/science/article/pii/S1364032121002653

From the abstract: "In the model, biomass waste is used for biogas and biochar production, and biogas residues are further cracked into biochar. Biochar is also used as an additive to modify the AD process and promote methane production. In addition to its single application, biochar is further used in combination with biogas slurry or residue as a soil conditioner to repair soil and promote the growth of crops."

Biochar mortar
Navaratnam, S, H Wijaya, P Rajeev, ... P Mendis - Case Studies in, (2021) "Residual Stress-Strain Relationship for the Biochar-Based Mortar after Exposure to Elevated Temperature." Elsevier.

From the Abstract: "The 5% weight of cement replaced by biochar performed better than other
specimen at elevated temperature as it retains about 88 %, 76 % and 38 % of compressive strength, respectively after being exposed to 200 °C, 450 °C and 700 °C.

❖ **Biochar with vermicomposting**


From the Abstract: “Vermicomposting with biochar resulted in a slight pH shift. Reduction in organic carbon (OC) percentage not so significant in biochar added food and beverage industry sludge (FBIS) and cow dung (CD). An increase in phosphorus and potassium content and a decrease in nitrogen percentage observed; vermicomposting with biochar resulted in higher seed germination, root elongation, and germination index than vermicomposting without biochar.”

❖ **Biochar with poultry manure — smallholder — soil and yield of common bean**


From the Abstract: “Treatment combination BC (10 t/ha ) + poultry manure (PM) (5 t/ha) significantly improved phosphorus concentration, enzymatic activities, WUE, and bean yield in this one-year experiment and it can be a viable management practice for smallholder farmers in the Brazilian sub-humid region.”

www.biochar-international.org  info@biochar-international.org

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Work with IBI!

IBI offers the following options for collaboration with scientific projects. Select the package best for your organization and complete the accompanying payment form.

☐ Silver Package 1

- a) IBI is posting a project description on its website with contact details, links, photos; the website can be updated once per year.
- b) IBI is sending out a project update in the monthly newsletter twice per year of the project
- c) Publications published by the project are guaranteed to be listed in the monthly IBI publications update.
- d) In-depth discussion of one publication per year by a member of the IBI Scientific Committee, sent out in the monthly IBI publication update and posted on the project site of IBI.

**Costs:** $1,000 per project year, payable at the beginning of the project year

☐ Gold Package 2

- a) Includes all services of Package 1.
- b) Webinar on project plans, progress or outcomes with a topic appropriate for IBI audience (one-hour webinar with about 50-100 participants worldwide), moderated by IBI, advertised globally, with Q&A session). Webinar is archived on the IBI website and can be seen by IBI members (add $1,000 for open access).

**Costs:** $4,000 per project year, payable at the beginning of the project year

☐ Platinum Package 3

- a) Includes all services of Packages 1 and 2.
- b) IBI excursion to your project at a time when it is attractive to a diverse audience ranging from scientists to industry representatives and policy makers, typically 40 attendees, who will pay for their own travel and a registration fee (see [https://biochar-international.org/event/ibi-biochar-study-tour-finland/](https://biochar-international.org/event/ibi-biochar-study-tour-finland/) for an example of previous excursions).

**Costs:** $15,000 per project year, payable at the beginning of the project year

Packages can vary for each project year (i.e., a project may opt for Package 1 in year 1 and 2 of their project and for Package 2 in year 3). Please inquire for additional options and combination of services not mentioned above.
IBI will provide a letter of commitment that can be included in your proposal to a donor. If the proposal is approved and funded, IBI can work with purchase orders or contracts, as is easiest for the project.

International Biochar Initiative

IBI COLLABORATION WITH SCIENTIFIC PROJECTS

PLEASE PROVIDE YOUR NAME AND CURRENT BILLING ADDRESS:

Collaboration Options (Prices in U.S. Dollars)

☐ Platinum: $15,000
☐ Gold: $4,000
☐ Optional open webinar access (+$1,000)
☐ Silver: $1,000

Total amount enclosed: $_______

☐ check in U.S. dollars  ☐ cash in U.S. dollars  ☐ MC/Visa number:_______________________________

Exp. Date: ________ 3-Digit Security Code: ________  Name on Card: ________________________________

Email receipt to: __________________________________ / Phone #: ________________________________

Please enclose check or cash or provide credit card information, and send to the IBI Office:
by email (bschorr@ttcorp.com), fax (1-202-223-5537), or U.S. mail
(1211 Connecticut Avenue, NW, Suite 650, Washington, DC 20036, USA).

Thank you for your support!