



July 2015 News from the International Biochar Initiative

Did you know that IBI's Online Biochar Training Course is Ongoing?

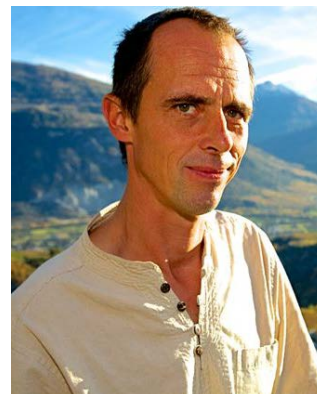
If you are interested in gaining more in-depth knowledge on biochar and biochar systems, consider registering for IBI's recently launched online course, [Biochar Training for Environmental Sustainability and Economic Development](#). This ten week, ongoing course provides participants an intensive training series on all aspects of biochar, presented by leading biochar experts. Participants have the opportunity to learn about best-science updates on biochar to promote the uptake of biochar production and use, and actions necessary to overcome the barriers to commercialization of the biochar industry. The course contains 19 separate lessons— each with a subject overview, a recorded audio/video presentation lasting 30 – 45 minutes (some lessons contain more than one video), and quizzes to test comprehension and retention. There is also an optional introductory presentation on the basics of biochar and the IBI so that all participants start the course with a common understanding of both. Course materials are presented in a user-friendly online format and 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.

August IBI Webinar Series Event: Hans-Peter Schmidt presents "*Farm scale biochar production, nutrient enhancement and soil application techniques*"

IBI is proud to welcome Hans-Peter Schmidt of the Ithaka Institute for our August *IBI Webinar Series* event. Mr. Schmidt will discuss how biochar prices from industrial production are at levels that may make its use in most agricultural settings economically non-viable. This scenario can change when farmers produce—on farm—their own biochar from residues such as straw, husks, shrubs, cuttings, and prunings in smaller scale, low-cost biochar kilns. He will detail how farmers can combine biochar production with on-farm waste management, biomass heat generation, and on-site organic fertilizer production. Using Kon-Tiki type flame curtain pyrolysis systems, the cost per tonne of biochar could decrease significantly from the current market price.



The webinar will present the Kon-Tiki farm-scale biochar production system, show how to make organic biochar based fertilizer, how to apply nutrient enhanced biochar most efficiently, and present highly encouraging results of various field trials.

Mr Schmidt founded the Ithaka Institute for carbon strategies in Valais (Switzerland) developing concepts for the remediation of agro-ecosystems and carbon sequestration through agronomic methods. He is behind the concept of biochar cascading applications in animal farming. He guided the development of the European Biochar Certificate (EBC) and in 2014 he developed (with Paul Taylor) the Kon-Tiki flame curtain kilns that spread as open source technology to 25 countries in less than a year.

[Registration is open now](#) and the webinar will be held on **Thursday, August 20th at 16:00 GMT** (which is 12:00p.m. Eastern Time or the time in New York City). Note: Please convert the 12:00p.m. ET start time to your [local time by using this time converter tool](#). You must be a dues-paying member to participate in these special events.

IBI members can view this and all prior *IBI Webinar Series* presentations by logging into the IBI member's only site at <https://ibi.memberclicks.net/login>. If you are not an IBI member and would like to join in order to view presentations, [please click here](#). For more information on *IBI's Webinar Series*, please see: http://www.biochar-international.org/webinar_series.

Port of Tacoma: Using Biochar as a Component for Stormwater Filtration in a Log Yard

By Erin Rasmussen and Tom Miles

The Port of Tacoma (based in Washington State) is the fifth largest water port in the United States and holds containers, automobiles, grain, and logs prior to transport. Washington State has some of the most strict stormwater regulations in the United States, so all goods and traffic coming in and out of the port are carefully monitored. Log yards are of particular concern as stormwater runoff can be contaminated with metals, organic pollutants, and particulate matter associated with log processing. The West Hylebos Log Yard at the Port of Tacoma is a 25-acre yard that debarks and sorts logs prior to their export (millions of board feet of lumber and logs are shipped each year).



Debarking the logs is part of the Port's pest control strategy, but debris from the process and the heavy traffic at the log sort facility made conventional best management practices unfeasible when the Port had to upgrade existing stormwater infrastructure to meet new regulations. The Port of Tacoma, working with the company, Kennedy/Jenks Consulting, considered various water treatment options. Aggregate data from that analysis identified biofiltration as a solution that was both cost-effective and the best fit for the West Hylebos Log Yard requirements. This system, created by the Port and Kennedy/Jenks Consultants, uses biochar as one of the components for filtration.

To read the remainder of this story, please see: http://www.biochar-international.org/profile_Port_of_Tacoma.
Image courtesy of Kennedy/Jenks Consultants

Opportunities in Biochar

- Submit an Abstract to the Joint International Biochar Symposium 2015, Geisenheim, Germany (**due August 2, 2015**); for more information, see <http://www.biochar-international.org/node/6887>
- Propose a special session for the upcoming Asia Pacific Biochar Conference 2016; for more information, see <http://www.biochar.co.kr/>
- Take advantage of a free subscription to Biomass Magazine. More information is available at <http://www.biochar-international.org/node/5537>
- Download the open access biochar book: *Biochar Culture*, by Dr Sai Bhaskar Reddy Nakka. The text highlights the use of biochar in communities and its potential for increased sustainable agriculture in smaller scale farmsteads and homes, focusing on work in India. The book can be accessed at <http://www.biocharculture.com>
- Job postings in biochar (as well as research/educational opportunities) can be accessed at <http://www.biochar-international.org/network/jobs>
- Looking for potential grant funding? Check out the Terra Viva Grants Directory which develops and manages information about grants for agriculture, energy, environment, and natural resources in the world's developing countries at <http://www.terravivagrants.org/Home>

Upcoming Calendar Events

- July 28: Webinar: Biochar and Applications for Restoration in the Uinta Basin. For more information: <http://www.biochar-international.org/node/6984>
- Aug 18 – 20: The 4th China International Biomass Energy Exhibition 2015. Location: Guangzhou, China. For more information: <http://www.biochar-international.org/node/6654>
- August 20: August IBI Webinar Series: Hans-Peter Schmidt presents “Farm scale biochar production, nutrient enhancement, and soil application techniques”. For more information: <http://www.biochar-international.org/node/7004>
- September 17 – 18: Advanced Compost and Biochar Processings: Solution for Economical Phosphorus Recovery Conference. Location: Toledo, Spain. For more information: <http://www.biochar-international.org/node/6995>
- September 20 – 24: 5th International Symposium on Soil Organic Matter (SOM) 2015. Location: Göttingen, Germany. For more information: <http://www.biochar-international.org/node/5246>
- September 28 – 30: Joint International Biochar Symposium 2015. Location: Geisenheim, Germany. For more information: <http://www.biochar-international.org/node/6886>
- November 15 – 18: 2015 American Society of Agronomy meeting (includes 5 biochar sessions). Location: Minneapolis, MN, USA. For more information: <http://www.biochar-international.org/node/6553>

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

Regional Biochar Group Update

A new biochar group has been formed in Pakistan to focus on biochar research and outreach. The *Biochar Research Group - Pakistan*, is creating a platform for biochar researchers from different institutions in Pakistan to work collaboratively on biochar and create a biochar database to help other scientists, students, farmers and industry contacts connect. It is intended that this group also act as a platform to prepare and implement joint research projects on the national and international level. For more information, please see: http://www.biochar-international.org/Regional_Pakistan.

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 infringement laws, 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](#).

Abbasi, M. Kaleem; Ahsan Ali Anwar (2015). Ameliorating Effects of Biochar Derived from Poultry Manure and White Clover Residues on Soil Nutrient Status and Plant growth Promotion - Greenhouse Experiments. PLOS ONE. DOI 10.1371/journal.pone.0131592

Ahmad, Mushtaq; Habib Akbar, Mohammad Tariq Jan, Mohammad Jamal Khan and Abdul bari (2015). Effect of Sowing Depths, Nitrogen Placement Methods and Biochar on Quantitative and Qualitative Attributes of Sugar Beet and its Weeds. Pak. J. Weed Sci. Res; [http://www.wssp.org.pk/vol-21-2-2015/5.%20PJWSR-33-2015%2021\(2\)%20final.pdf](http://www.wssp.org.pk/vol-21-2-2015/5.%20PJWSR-33-2015%2021(2)%20final.pdf)

Akhter, Adnan; Karin Hage-Ahmed, Gerhard Soja and Siegrid Steinkellner (2015). Compost and biochar alter mycorrhization, tomato root exudation and development of Fusarium oxysporum f. sp. Lycopersici. Frontiers in Plant Science. DOI 10.3389/fpls.2015.00529

Atucha, Amaya (2015). Effect of Biochar Amendments on Peach Replant Disease. HortScience; <http://hortsci.ashspublications.org/content/50/6/863.short>

Aysu, Tefvik; Aimaro Sanna (2015). Nannochloropsis algae pyrolysis with ceria-based catalysts for production of high-quality bio-oils. Bioresource Technology. DOI 10.1016/j.biortech.2015.07.027

Beckford, Fitzroy Barrington (2015). Advancing an integrated food energy system (IFES) in Haiti: Applying resiliency and sustainability models in ecologically degraded environments. Dissertation: Prescott College; <http://gradworks.umi.com/37/06/3706257.html>

Brendová, K.; P. Tlustoš, J. Száková (2015). Biochar immobilizes cadmium and zinc and improves phytoextraction potential of willow plants on extremely contaminated soil. Plant, Soil and Environment. DOI 10.17221/181/2015-PSE

Burud, Ingunn; Christophe Moni, Andreas Flo, Cecilia Futsaether, Markus Steffens, Daniel P. Rasse (2015). Qualitative and quantitative mapping of biochar in a soil profile using hyperspectral imaging. Soil and Tillage Research. DOI 10.1016/j.still.2015.06.020

Castellini, M.; L. Giglio, M. Niedda, A.D. Palumbo, D. Ventrella (2015). Impact of biochar addition on the physical and hydraulic properties of a clay soil. Soil and Tillage Research. Volume 154. Pages 1-13; <http://www.sciencedirect.com/science/article/pii/S0167198715001336>

Chen Xin-Xiang, He Xu-Sheng, Geng Zeng-Chao, Shang Jie, Zhao Jun, Liu Chun-Yan, Wang Ya-ping, Yin Xiao-han (2015). Relationship between soil biological activities and soil fertility after biochar application. Agricultural Research in the Arid Areas; http://d.wanfangdata.com.cn/periodical_ghdqnyj201503008.aspx

Chun-Jiao, Zou; Zhang Yong-Yong; Zhang Yi-Ming; Guo Xiao-Ou; Li Ming-Jing; Li Tian-lai (2015). Regulation of biochar on matrix enzyme activities and microorganisms around cucumber roots under continuous cropping. Yingyong Shengtai Xuebao

De-Li Tong and Ren-Kou Xu (2015). Ameliorating Effects of Fungus Chaff and Its Biochar on Soil Acidity. Communications in Soil Science and Plant Analysis; <http://www.tandfonline.com/doi/abs/10.1080/00103624.2015.1068323#.Va5-7fmqqko>

- DeMessie, Bluyé; E. Sahle-Demessie & George A. Soriala (2015). Cleaning Water Contaminated With Heavy Metal Ions Using Pyrolyzed Biochar Adsorbents. Separation Science and Technology. DOI 10.1080/01496395.2015.1064134
- Dengyu Chen, Zhongcheng Zheng, Kexin Fu, Ze Zeng, Jiajia Wang, Mengting Lu (2015). Torrefaction of biomass stalk and its effect on the yield and quality of pyrolysis products. Fuel. DOI 10.1016/j.fuel.2015.06.078
- Gamage, Duminda Vidana; Ranjit Mapa, Rambadoge Dharmakeerthi, Asim Biswas (2015). Effect of rice husk biochar on selected soil properties in tropical Alfisols. Soil, Land Care & Environmental Research; http://www.publish.csiro.au/view/journals/dsp_journals_pip_abstract_Scholar1.cfm?nid=84&pip=SR15102
- Garcia-Perez, Manuel; Jesus Alberto Garcia-Nunez, Manuel Raul Pelaez-Samaniego, Chad Eugene Krunger, Mark Raymond Fuchs, Gloria Eileen Flora (2015). Sustainability, Business Models, and Techno-Economic Analysis of Biomass Pyrolysis Technologies. Book Chapter:10 (Innovative Solutions in Fluid-Particle Systems and Renewable Energy Management. DOI 10.4018/978-1-4666-8711-0c.ch010
- Guimarães, Gelton G. F.; Diogo M. Paiva, Reinaldo B. Cantarutti, Edson M. Mattielloa and Efraim L. Reis (2015). Volatilization of Ammonia Originating from Urea Treated with Oxidized Charcoal. J. Braz. Chem. Soc.; <http://jbcs.sbq.org.br/imagebank/pdf/150147AR.pdf>
- Hardie, Marcus A.; Garth Oliver, Brent E. Clothier, Sally A. Bound, Steve A. Green and Dugald C. Close (2015). Effect of Biochar on Nutrient Leaching in a Young Apple Orchard. Journal of Environmental Quality. DOI 10.2134/jeq2015.02.0068
- Harish, B.S; M. Janaki Ramaiah, Kiran Babu Uppuluri (2015). Bioengineering strategies on catalysis for the effective production of renewable and sustainable energy. Renewable and Sustainable Energy Reviews. DOI 10.1016/j.rser.2015.06.030
- Hongmei Gu, Richard Bergman (2015). Life-cycle GHG emissions of electricity from syngas produced by pyrolyzing woody biomass. Proceedings of the 58th International Convention of Society of Wood Science and Technology; http://www.fpl.fs.fed.us/documnts/pdf2015/fpl_2015_gu001.pdf
- Horák, Ján; Dušan Igaz (2015). Impact of Biochar Amendment on Soil Ph of Orthic Luvisol at the Research Site Located in Western Slovakia. Journal of International Scientific Publications; <http://www.scientific-publications.net/get/1000011/1432800959622187.pdf>
- Hu Lin-Chao, Chen Li-Na, Yin Yong, Huang Zhao-Qin, Dai Jing-yu (2015). Preliminary Study on the Structural Characteristics of Residue from Rice Straw Burning in Field. Spectroscopy and Spectral Analysis; <http://www.gpxygpfx.com/qikan/epaper/zhaiyao.asp?bsid=22229>
- Hyuck-Soo Kim, Kwon-Rae Kim, Jae E. Yang, Yong Sik Ok, Gary Owens, Thomas Nehls, Gerd Wessolek, Kye-Hoon Kim (2015). Effect of biochar on reclaimed tidal land soil properties and maize (*Zea mays* L.) response. Chemosphere. DOI 10.1016/j.chemosphere.2015.06.041
- Iriarte-Velasco, Unai; Irene Sierra, Emilio Atilano Cepeda, Raquel Bravo and Jose Luis Ayastuy (2015). Methylene blue adsorption by chemically activated waste pork bones. Coloration Technology. DOI 10.1111/cote.12160
- Ismadji, Suryadi; Dong Shen Tong, Felycia Edi Soetaredjo, Aning Ayucitra, Wei Hua Yu, Chun Hui Zhou (2015). Bentonite-hydrochar composite for removal of ammonium from Koi fish tank. Applied Clay Science. DOI 10.1016/j.clay.2015.06.025
- Karim, Adnan Asad; Manish Kumar, Sanghamitra Mohapatra, C. R Panda and Ankit Singh (2015). Banana Peduncle Biochar: Characteristics and Adsorption of Hexavalent Chromium from Aqueous

Solution. International Research Journal of Pure & Applied Chemistry;
http://www.researchgate.net/profile/Manish_Kumar158/publication/272728572_Banana_Peduncle_Biochar_Characteristics_and_Adsorption_of_Hexavalent_Chromium_from_Aqueous_Solution/links/54ec7730cf2465f532f5f55.pdf

Kearns, Joshua P.; Kyle K. Shimabuku, Ryan B. Mahoney, Detlef R. U. Knappe and R. Scott Summers (2015). Meeting multiple water quality objectives through treatment using locally generated char: improving organoleptic properties and removing synthetic organic contaminants and disinfection by-products. Journal of Water, Sanitation & Hygiene for Development;
<http://www.iwaponline.com/washdev/up/washdev2015172.htm>

Keiblinger, Katharina M.; Dong Liu, Axel Mentler, Franz Zehetner, Sophie Zechmeister-Boltenstern (2015). Biochar application reduces protein sorption in soil. Organic Geochemistry. DOI 10.1016/j.orggeochem.2015.06.005

Kumar, Dinesh; Kamal K. Pant (2015). Production and characterization of biocrude and biochar obtained from non-edible de-oiled seed cakes hydrothermal conversion. Journal of Analytical and Applied Pyrolysis. DOI 10.1016/j.jaap.2015.06.014

Li Sai-jun, Lu Jin-hong, Li Jian-fa (2015). Sorption of Pesticides by Biochars and Influence on Their Environmental Behaviors in Soil. Hubei Agricultural Sciences;
http://d.wanfangdata.com.cn/periodical_hbnykx201508001.aspx

Li Yu-mei, Song Bai-quan, Liu Zheng-yu, Wang Gen-lin, Wei Dan, Jin Liang (2015). Effects of Bio-char on Sugar Beet Growth in Clomazone Residual Soil. Journal of Agricultural Resources and Environment;
http://d.wanfangdata.com.cn/periodical_nyhjyfz201503009.aspx

Li Zhongyang; Qi Xuebin; Fan Xiangyang; Wu Haiqing; Du Zhenjie; Li Ping; Lü Mouchao (2015). Transactions of the Chinese Society of Agricultural Engineering. Influences of biochars on growth, yield, water use efficiency and root morphology of winter wheat.

Lim, T.J.; K.A. Spokas, G. Feyereisen, J.M. Novak (2015). Predicting the impact of biochar additions on soil hydraulic properties. Chemosphere. DOI 10.1016/j.chemosphere.2015.06.069

Liu, Qing-Song & Yi-Jing Li (2015). Sorption and reduction of hexavalent chromium from aqueous solutions by surface modified biochars. Separation Science and Technology. DOI 10.1080/01496395.2015.1062026

Liu Ruilong, Liu Shike, Xin Jia, Liu Xiang, Feng Jian, Zhang Yinghui (2015). Effect of bio-char addition on BDE-47 sorption and desorption behaviors on soil. Environmental Pollution and Control;
http://d.wanfangdata.com.cn/periodical_hjwryfz201505010.aspx

Lotter, Don; Nathan Hunter, Mary Straub and David Msola (2015). Microgasification cookstoves and pellet fuels from waste biomass: A cost and performance comparison with charcoal and natural gas in Tanzania. African Journal of Environmental Science and Technology;
http://www.academicjournals.org/article/article1435403105_Lotter%20et%20al.pdf

Maarit; Niemi, R; Heiskanen, Ilse; Saarnio, Sanna (2015). Weak effects of biochar amendment on soil enzyme activities in mesocosms in bare or Phleum pratense soil. Boreal Environment Research

Macdonald, LM; Williams, M; Oliver, D; Kookana, R (2015). Biochar and hydrochar as low-cost sorbents for removing contaminants from water. Journal of the Australian Water Association;
<http://search.informit.com.au/documentSummary;dn=269604591550627;res=IELAPA>

Matt, Clarice P. (2015). An assessment of biochar amended soilless media for nursery propagation of northern Rocky Mountain native plants. Thesis: The University of Montana; College of Forestry and Conservation; <http://scholarworks.umt.edu/etd/4420>

Melo, Leônidas C. A.; Aline P. Puga, Aline R. Coscione, Luke Beesley, Cleide A. Abreu, Otávio A. Camargo (2015). Sorption and desorption of cadmium and zinc in two tropical soils amended with sugarcane-straw-derived biochar. *Journal of Soils and Sediments*. DOI 10.1007/s11368-015-1199-y

Mitra, Sudip; Pooja Singh, Shabana Manzoor, Pradip Bhattacharyya, Tanumoy Bera, Ashok Kumar Patra, Latha Rangan and Pallabi Borah (2015). Can rice and wheat biochar amendment protect the carbon loss from tropical soils—An experimental study. *Environmental Progress & Sustainable Energy*. DOI 10.1002/ep.12193

Novak, Jeff; Gilbert Sigua, Don Watts, Keri Cantrell, Paul Shumaker, Ariel Szogi, Mark G. Johnson, Kurt Spokas (2015). Biochars impact on water infiltration and water quality through a compacted subsoil layer. *Chemosphere*. DOI 10.1016/j.chemosphere.2015.06.038

Okoroigwe, Edmund C; Zhenglong Li, Shantanu Kelkar, Christopher Saffron, Samuel Onyegegbu (2015). Bio-oil yield potential of some tropical woody biomass. *Journal of Energy in Southern Africa*; <http://www.erc.uct.ac.za/jesa/Volume26/26-2-jesa-okoroigwe-et-al.pdf>

Özbay, Günay (2015). Pyrolysis of Firwood (*Abies bornmülleriana* Mattf.) Sawdust: Characterization of Bio-Oil and Bio-Char. *Drvna industrija (Wood industry)*; http://hrcak.srce.hr/index.php?show=clanak&id_clanak_jezik=207493

Puga, A. P.; C. A. Abreu, L. C. A. Melo, J. Paz-Ferreiro, L. Beesley (2015). Cadmium, lead, and zinc mobility and plant uptake in a mine soil amended with sugarcane straw biochar. *Environmental Science and Pollution Research*. DOI 10.1007/s11356-015-4977-6

Rehman, Muhammad Saif Ur; Ilgook Kim, Naim Rashid, Malik Adeel Umer, Muhammad Sajid, and Jong-In Han (2015). Adsorption of Brilliant Green dye on biochar prepared from lignocellulosic bioethanol plant waste. *CLEAN – Soil, Air, Water*. DOI 10.1002/clen.201300954

Roberts, David A.; Andrew J. Cole, Nicholas A. Paul, Rocky de Nys (2015). Algal biochar enhances the re-vegetation of stockpiled mine soils with native grass. *Journal of Environmental Management*; <http://www.sciencedirect.com/science/article/pii/S030147971530147X>

Rombolà, Alessandro Girolamo; Giovanni Marisi, Cristian Torri, Daniele Fabbri, Alessandro Buscaroli, Michele Ghidotti, and Andreas Hornung (2015). Relationships between chemical characteristics and phytotoxicity of biochar from poultry litter pyrolysis. *Journal of Agricultural and Food Chemistry*. DOI 10.1021/acs.jafc.5b01540

Salleh, M. A. Mohd; H. K. Nsamba, H. M. Yusuf, A. Idris and W. A. Wan Ab. Karim Ghani (2015). Effect of Equivalence Ratio and Particle Size on EFB Char Gasification. *Energy Sources, Part A: Recovery, Utilization, and Environmental Effects*; <http://www.tandfonline.com/doi/abs/10.1080/15567036.2011.555440#.Va5cVfmqgko>

Shang Jie; Geng Zengchao, Zhao Jun, Geng Rong, Zhao Ying Tsui (2015). Effect of biochar on Lou soil-water thermal characteristics and aggregate stability. *Chinese Journal of Applied Ecology*; <http://www.cjae.net/CN/article/downloadArticleFile.do?attachType=PDF&id=20116>

Thuy Nguyen Thu, Loan Bui Thi Phuong, Trinh Mai Van, and Son Nguyen Hong (2015). Effect of Water Regimes and Organic Matter Strategies on Mitigating Green House Gas Emission from Rice Cultivation and Co-benefits in Agriculture in Vietnam. *International Journal of Environmental Science and Development*; <http://www.ijesd.org/vol7/746-A0048.pdf>

Wan Hui-Xia, Feng Xiao-Hu, Zhang Wen-Mei, Pei Jian-Feng, Jiao Yong-Ji, Li Ming, Jiang Shi-jun (2015). Control Effect of Eco-biochar on Tobacco Bacterial Wilt and Its Soil Microecological Mechanism. *Acta Agriculturae Jiangxi*; http://d.wanfangdata.com.cn/periodical_jxnyxb201506023.aspx

Wang Ding Mei; Wang Yuejiang, Yúzhèn, Liu Jing, Zhou Shungui (2015). Synergistic effect on carbon and nitrogen fixation of biochar during co-pyrolysis of sewage sludge and rice straw. *Acta Scientiae Circumstantiae*; http://www.actasc.cn/hjkxxb/ch/reader/view_abstract.aspx?file_no=20140806003

Wang Huihui; Hu Zhengyi, Zhu Xiaoqi, Zhou Guohui (2015). Comparison of Nitrogen Loss after Biochar Coated Urea and Common Urea Fertilization in Vegetable Soil at Chaihe Catchment of Dianchi Lake. *Journal of Anhui Agricultural Sciences*; http://d.wanfangdata.com.cn/periodical_ahnykx201518034.aspx

Wang, Jinyang; M. E. Dokohely, Zhengqin Xiong, Yakov Kuzyakov (2015). Contrasting effects of aged and fresh biochars on glucose-induced priming and microbial activities in paddy soil. *Journal of Soils and Sediments*. DOI 10.1007/s11368-015-1189-0

Wang Pei-ran (2015). The Research Progress of Biochar Degradation of Organic Pollutants. *Journal of Anhui Agricultural Sciences*; http://d.wanfangdata.com.cn/periodical_ahnykx201517091.aspx

Wang Yuhong; Xiao Hui, Cheng Wenjuan, Wang Liyan, Pan Jie, Gaoxiánbiao (2015). Effects of Biochar Fertilizer on Soil Fertility, Tomato Yield and Quality in Greenhouse. *Journal of Anhui Agricultural Sciences*; http://d.wanfangdata.com.cn/periodical_ahnykx201516132.aspx

Weihua Xu, Hao Jian, Yunguo Liu, Guangming Zeng, Xin Li, Yanling Gu & Xiaofei Tan (2015). Removal of chromium (VI) from aqueous solution using mycelial pellets of *Penicillium simplicissimum* impregnated with powdered biochar. *Bioremediation Journal*; <http://www.tandfonline.com/doi/abs/10.1080/10889868.2015.1066302#.Va5exfmqgko>

Wen Jing, Yang Dan-Dan, Lin Qi-Mei, Li Gui-Tong, Zhao Xiao-Rong, Wu Gui-fang (2015). Effect of biochar-inorganic complex fertilizer on soil fertility and biomass of maize and soybean. *Soils and Fertilizers Sciences in China*; http://d.wanfangdata.com.cn/periodical_trf1201503014.aspx

Wen-Liang Wang, Xue-Yong Ren, Jian-Min Chang, Li-Ping Cai, Sheldon Q. Shi (2015). Characterization of bio-oils and bio-chars obtained from the catalytic pyrolysis of alkali lignin with metal chlorides. *Fuel Processing Technology*. DOI 10.1016/j.fuproc.2015.06.048

Wrobel-Tobiszewska, A.; M. Boersma, J. Sargison, P. Adamsd, S. Jarick (2015). An economic analysis of biochar production using residues from Eucalypt plantations. *Biomass and Bioenergy*. DOI 10.1016/j.biombioe.2015.06.015

Vogel, I; R Schatten, R Wagner, K Terytze (2015). Rechtliche Situation der Anwendung von Biokohle in der Bundesrepublik Deutschland (Legal situation of the An-use of biochar in the Federal Republic of Germany). https://www.muellundabfall.de/download/123627/mua_20150704.pdf

Volpe, Maurizio Domenico Panno, Roberto Volpe, Antonio Messineo (2015). Upgrade of citrus waste as a biofuel via slow pyrolysis. *Journal of Analytical and Applied Pyrolysis*. DOI 10.1016/j.jaap.2015.06.015

Xie, T., Sadasivam, B., Reddy, K., Wang, C., and Spokas, K. (2015). Review of the Effects of Biochar Amendment on Soil Properties and Carbon Sequestration. *Journal of Hazardous, Toxic, and Radioactive Waste*. DOI 10.1061/(ASCE)HZ.2153-5515.0000293

Xu Yanzhe and Fang Zhanqiang (2015). Advances on Remediation of Heavy Metal in the Soil by Biochar. *Environmental Engineering*; http://d.wanfangdata.com.cn/periodical_hjgc201502035.aspx

Xue Chaoqun, Yang Lijun, Wang Jianwei (2015). Effects of Biochar Application Rate on Net Photosynthetic Rate and Aroma Component Content of Flue-cured Tobacco Leaves. Tobacco Science & Technology; http://d.wanfangdata.com.cn/periodical_yckj201505004.aspx

Yang Jin-Feng, Jiang Tong, Han Xiao-Ri, Li Dan, Zhang Chun-Fang, Wang Yue, Huang Yu-qian (2015). Effects of continuous application of biochar-based fertilizer on soil characters and yield under peanuts continuous cropping. Soils and Fertilizers Sciences in China; http://d.wanfangdata.com.cn/periodical_trfj201503013.aspx

Ye Xiefeng, Yu Xiaona, Meng Qi, Liu Yingchang, Song Xianfeng, Liu Guoqing, Liu Yuanyuan, Nie Xin (2015). Analysis of Physical and Chemical Properties of Carbonized Tobacco Stalks. Tobacco Science & Technology; http://d.wanfangdata.com.cn/periodical_yckj201505003.aspx

Yu, L; Y Wang, Y Yuan, J Tang, S Zhou (2015). Biochar as electron acceptor for microbial extracellular respiration. Geomicrobiology Journal; <http://www.tandfonline.com/doi/abs/10.1080/01490451.2015.1062060>

Yue Yan, Guo Wei-Na, Lin Qi-Mei, Li Gui-Tong, Zhao Xiao-Rong, Wu Gui-fang (2015). Effect of biochar on salt leaching in different soil layers. Agricultural Research in the Arid Areas; http://d.wanfangdata.com.cn/periodical_ghdqnyyj201503010.aspx

Zabaniotou, A.; D. Rovas, M. Monteleone (2015). Management of Olive Grove Pruning and Solid Waste from Olive Oil Extraction via Thermochemical Processes. Waste and Biomass Valorization. DOI 10.1007/s12649-015-9403-2

Zhao, Yijun; Dongdong Feng, Yu Zhang, Yudong Huang, Shaozeng Sun (2015). Effect of pyrolysis temperature on char structure and chemical speciation of alkali and alkaline earth metallic species in biochar. Fuel Processing Technology. DOI 10.1016/j.fuproc.2015.06.029

Zhang, Shuping; Qing Dong, Li Zhang, Yuanquan Xiong, Xinzhi Liu, Shuguang Zhu (2015). Effects of water washing and torrefaction pretreatments on rice husk pyrolysis by microwave heating. Bioresource Technology. DOI 10.1016/j.biortech.2015.06.142

Zhou Zhen-Feng, Wang Jian-Chao, Rao Xiao-xiao (2015). Impact of Adding Biochar on Enzyme Activity in Soil. Acta Agriculturae Jiangxi; http://d.wanfangdata.com.cn/periodical_jxnyxb201506027.aspx