Third Conference of the International Biochar Initiative
Rio de Janeiro, Brazil

SUNDAY, September 12

17:00 – 19:00 Welcome reception and registration, Salão Itaipú

MONDAY, September 13

8:00 – 9:30: Opening, Salão Itaipú

- **Debbie Reed**, IBI Executive Director: Welcome to the Conference of the International Biochar Initiative
- **Etelvino Novotny**, Chair of the Organizing Committee, Embrapa: Welcome to Brazil and program details
- **Laércio Couto**: Welcome
- **Bill McKibben**, author, environmentalist and 350.org (by video): Welcome

9:30 – 11:00 Session 1: Plenary: Characterization of Biochars, Salão Itaipú

- Keynote: **Heike Knicker**
- **Marta Camps**, Massey University: *Contribution to the characterization of Biochars for the Prediction of their Carbon Longevity* (co-authors R. Calvelo Pereira, R. Pardo Lorenzo, W. Aitkenhead, F. Macías, M. Hedley, J. A. Maciá-Agulló)
- **Keith Driver,** Leading Carbon Ltd: *The IBI's efforts for defining and characterizing biochar*
- **Etelvino Novotny**, Embrapa: *C-13 and P-31 NMR analyses of swine bone biochar* (co-authors Ruben Auccaise, Marcia H.R. Velloso, Juliano C. Corrêa, Martha M. Higarashi, Valéria M.N. Abreu, José D. Rocha)

11:00 -11:30 Break

11:30 – 13:00 Session 2: Plenary: Biochar Application to Soil, Salão Itaipú

- Keynote: **Beata Madari**
- **Afeng Zhang**, Nanjing Agricultural University: *Effect of biochar amendments on rice yield, soil respiration and greenhouse gas emissions from heavy metal polluted and non-polluted paddy from Tai Lake plain, China* (co-authors Pan Genxing, Li Lianqing, Zhang Xuhui, Zheng Jinwei, Cui Liqiang)
- **Lukas van Zwieten**, Industry and Investment NSW: Climate in Primary Industries: *Influence of biochar on soil fertility, carbon storage and biomass production in a subtropical pasture: results from a 3 year field study* (co-authors K. Sinclair, P. Slavich, SG Morris, S Kimber, A Downie)
- **Michael Hayes**, University of Limerick: *Development of a Biochar Classification System based on its effect on plant growth* (co-authors C. Byrne, W. Kwapinski, P. Wolfram, F. Melligan, E.H. Novotny, J.J. Leahy)

13:00 – 14:00 Lunch

14:00 - 16:00 Session 3: Parallel sessions

Parallel A: Characterization of Biochars, Salão Itaipú

- **Chee Hung Chia**, University of New South Wales: *Nanoscale characterization of Biochar Mineral Complex* (co-authors: Paul Munroe, Stephen Joseph, Yun Lin)
- **Etelvino Novotny**, Embrapa: *Selective extraction of the characteristic humic fraction from Terras Pretas de Índios* (co-authors: Marcia H.R. Velloso, Eduardo R. de Azevedo, Tito J. Bonagamba, Guixue Song, Michael H.B. Hayes)
- **Stephen Joseph**, AnthroTerra: *Characterization for commercialization: what the consumer needs to know* (co-authors: M Camps, R Blackwell, A Zwioloski, J Major)
- **Kasiviswanathan Muthukumarappan**, South Dakota State University: *Production and characterization of biochar from different feedstocks* (co-author: Arulprakash Sivasastri)
- **David Waters**, Charles Stuart University: *Biochar-ion interactions: An investigation of biochar charge* (co-authors: Jason Condon, Lukas Van Zwieten, Sergio Moroni)

Parallel B: Biochar Production, Sala Guaratiba

- **Michael Halwachs**, Bioenergy 2020+ GmbH: *A comprehensive approach of using agricultural residues to substitute fossil fuels and producing biochar in a 3 MW pyrolysis plant* (co-authors: G. Kampichler, S. Kern, T. Pröll, H. Hofbauer)
- **Mohamad Amran Mohd Salleh**, Universiti Putra Malaysia: *Development of a large scale oil palm empty fruit bunch (EFB) biochar plant* (co-authors: Azni Idris, Lau Lek Hang, Ethe Raj)
- **Andreas Frank,** Werkstoff+Funktion Grimmel Wassertechnik GmbH: *Biochar production via low temperature conversion (LTC) technology using a Thermocatalytic Loop type reactor* (co-authors: W. Grimmel, E.A. Stadlbauer, B. Weber, M. P. Bayer, K. Albert)
- **Hector B. Sierra,** Artesano Natural SA de CV: *The making and uses of Biocarb, a treated biochar*
- **Corinna Byrne**, University of Limerick: *Bio-char from biorefinery residue* (co-authors: M.H.B. Hayes, W. Kwapinski, E. Novotny, D. Haverty, P. Wolfram, J.J. Leahy)
- **Terukazu Kumazawa**, Ritsumeikan Global Innovation Research Organization: *Analyzing a simple biochar production process* (co-authors: Akira Shibata, Ryo Sekiya, Steven McGreevy, Hidehiko Kanegae)

Parallel C: Integrated Biochar Systems, Sala Mar Azul

- **Annette Cowie**, University of New England: *Ensuring sustainability for biochar: Learning from the experience of bioenergy*
- **Paul Anderson**, Biomass Energy Foundation (BEF): *The TLUD cookstove system with low-cost biochar production: Aggregating to large volume* (co-authors: Arthur R. Donnelly, Hugh McLaughlin, Karl J. Frogner)
- **Syd Shea,** University of Notre Dame Australia: *The development of a systems approach to the integration of pyrolysis of biomass into broad scale agriculture In Western Australia* (co-authors: P. Burgess, I. Stanley)

- **Jim Fournier**, Biochar Engineering Corporation: *Biochar Engineering Corporation; current technical and economic performance* (co-author: Lopa Brunjes)
- **Robert Lerner**: *Seeding biochar in Costa Rica: Profile of an integrated development program* (co-authors: Tamar Benjamin, Gabriella Soto, Julie Major, Stephen Joseph, Phil Covell, Frank Hicks, Jason Borner)

16:00 – 16:30 Coffee break

16:30 – 18:30 Session 4: Parallel sessions
Parallel A: Climate Change Mitigation Salão Itaipú

- **Jim Fournier**, Biochar Engineering Corporation: *Biochar's role in global carbon management*
- **Karl Frogner**, UB International: *The UBI concept: Low tech biochar from highly distributed feedstock in sustainable rural development for climate change mitigation*
- **John Gaunt**, Carbon Consulting LLC and Cornell University: *Biochar: Delivering a gigaton offset*
- **Christoph Steiner**, BIOCHAR.org: *Biochar carbon sequestration in tropical land use systems?* (co-author: Laurens Rademakers)
- **Guitong Li,** China Agricultural University: *Can biochar resolve the current soil and environmental problems in China?* (co-author: Qi-mei Lin)

Parallel B: Biochar Application to Soil Sala Guaratiba

- **Stephen Joseph,** University of New South Wales: *Does biochar lower the energy required for plants to take up nutrients by changing the redox potential in the rhizosphere*? (co-authors: M Camps-Arbestian, S. Donne, P Munroe, C H Chia, Y Lin, Arthur Ziolkowski)
- **David Guerena,** Cornell University: *Nitrogen use efficiency of maize after biochar additions to a temperate soil* (co-authors: Johannes Lehmann, Kelly Hanley, Akio Enders, Susan Riha)
- **Andreas Möller,** German Federal Institute for Geoscience and Natural Resources: *Effects of the application of biochars with different physicochemical properties on soil functions of two temperate soils* (co-authors: Nils Borchard, Jan, Wulf Amelung, Jens Utermann)
- **Maher Saleh,** Alexandria University: *Influence of biochar application on nitrogen use efficiency by wheat plants grown in Mediterranean soils* (co-authors: A. H. Mahmoud, K. A. Rateb)
- **Julie Major,** International Biochar Initiative: *Biochar field trials in Québec, Canada: Report on 2 years of biochar effect on crop productivity, and multiple biochar material testing* (co-author: Barry Husk)

Parallel C: Terra preta de Indio Sala Mar Azul

- **Jenaina Soares**, Universidade Federal de Minas Gerais: *The Terra Preta de Índios investigation by Raman spectroscopy and a sustainable agriculture* (co-authors: Newton Paulo de Souza Falcão, Carlos Alberto Achete, Ado Jorio de Vasconcelos)
- **Rodrigo Santana Macedo,** USP: *Physical, chemical and mineralogical characteristics of soils with anthropics horizons (Terra Preta de Índio) in the*

floodplains of Solimões river in the Central Amazon - Brazil (co-authors: Wenceslau Geraldes Teixeira, Hedinaldo Narciso Lima, Eduardo Góes Neves)

- **Fabricio Augusto Hansel**, Embrapa Florestas: *Presence of lipid compounds in the soil of Amazon archaeological sites* (co-authors: Claudia Maria Branco de Freitas Maia, Amanda da Silva Oliveira Santos, Wenceslau Geraldes Teixeira)

18:30 – 20:30 Poster Session I Salão Itaipú

18:30 – 20:30 Biochar Protocol Discussion Sala Guaratiba

John Gaunt (Carbon Consulting) and **Keith Driver** (Leading Carbon Ltd): *Building a Robust GHG Emission Reduction Quantification Protocol for Biochar*: The objective of this discussion is to consolidate current activity and move towards a coordinated initiative to build a robust GHG emission reduction quantification protocol for biochar projects. Information on the protocol can be found at www.biocharprotocol.org.

TUESDAY, September 14, 2010

8:00 – 10:00 Session 5: Parallel Sessions

Parallel A: Biochar Application to Soil Salão Itaipú

- **Andrew Cross,** UKBRC, University of Edinburgh: *The development of a toolkit for rapid assessment and prediction of biochar stability and agronomic utility* (co-authors: Saran Sohi and Maria Borlinghaus)
- **Alessandro Pozzi**, AGT Advanced Gasification Technology SRL: *Biochar application to soil: First experiences in North Italy with gasification plant products* (co-authors: Massimo Valagussa and Alberto Tosca)
- **Guitong Li,** China Agricultural University: *The effect of biochar amendment on carbonate chemical processes in soil* (co-authors: Zhen-cai Sun, Qi-mei Lin, Xiao-rong Zhao)
- **Peter Slavich,** Industry and Investment, NSW: *Rice husk biochar improves fertility of sandy soils in Central Coastal Vietnam* (co-authors: Hoang Minh Tam, Tran Tien Dung, Brad Keen)

Parallel B: Biochar Production Sala Guaratiba

- **Carolina Linhares**, Instituto de Química - Universidade Federal Fluminense: *Chemical functionalization of activated charcoal? Reproducing the Terra Preta de Índios organic matter model* (co-authors: Jasmin Lemke, Nathalia Amaral, Etelvino H. Novotny)
- **Stanley Stewchuk,** Saskatchewan Research Council: *The design and analysis of activated biochar material for control of elemental mercury emissions from industrial facilities into the global atmospheric pool* (co-authors: Dave Smith, Ramin Azargohar, Mahuya De, Ajay Dalai)
- **Stephen Joseph**, The University of New South Wales: *Formation, structure, and stability of biochar-mineral complexes* (co-authors: Paul Munroe, James Hook, Rita Henderson, Paul Thomas, Chee Chia, Paul Blackwell)
- **Jan Mumme,** Leibniz Institute for Agricultural Engineering Potsdam-Bornim: *Hydrothermal carbonization of residues from anaerobic digestion* (co-authors: Jürgen Kern, Fabian Rupp, Lion Eckervogt, Judith Pielert)

- **Marcela Guiotoku,** Embrapa Florestas: *Saccharides as raw material for biochar-like material production* (co-authors: Fabrício Augusto Hansel, Etelvino Henrique Novotny, Claudia Maria Branco de Freitas Maia)
- **Jane Lynch,** AnthroTerra Ltd: *IBI's pyrolysis sustainability guidelines* (co-author: Stephen Joseph)

Parallel C: Commercialization and Dissemination Sala Mar Azul

- **Terukazu Kumazawa**, Ritsumeikan Global Innovation Research Organization: *Toward diffusing "Cool Vegetables": Reconstructing rural socio-economic systems in Japan based on an eco-branding strategy biochar cultivated vegetables* (co-authors: Akira Shibata, Ryo Sekiya, Hidehiko Kanegae, Steven McGreevy)
- **Stewart McGlashan**, AnthroTerra Ltd: *Commercialization of biochar and biochar mineral complexes; a consumer centered approach* (co-authors: Stephen Joseph and Nikolaus Foidl)
- **Christelle Braun**, International Network for Bamboo and Rattan (INBAR): *Biochar in INBAR's programming: Building livelihoods, energy security, agricultural productivity, and protecting the environment through bamboo* (co-author: I. V. Ramanuja Rao)
- **Lukas Van Zwieten**, Industry and Investment NSW: Climate in Primary Industries: *Agro-economic valuation of biochar using field-derived data* (co-authors: Steve Kimber, Leanne Orr, Adriana Downie, Katrina Sinclair, Stephen Joseph, K. Yin Chan)
- **Paul Anderson,** Chip Energy Inc: *CHAB Camp: Hands-on development of "Combined Heat And Biochar" devices* (co-authors: Paul O. Taylor, Paul W. Wever)
- **Kelpie Wilson**, International Biochar Initiative: *Hands-On biochar education in two schools in the Pacific Northwest* (co-author: Darlyn Wendlandt)

10:00 – 10:30: Break

10:30 – 12:30 Session 6: Parallel Sessions

Parallel A: Agronomic and Environmental Behavior of Biochars Salão Itaipú

- **Ajay Dalai,** University of Saskatchewan: *Application of activated carbons prepared from biochar for soil amendment and crop yield improvement* (co-authors: Ramin Azargohar and Stanley Shewchuk)
- **Melinda Adams,** Purdue University: *The effect of biochar amendments on Andropogon gerardii (Big Bluestem) seedling growth* (co-authors: Kevin Gibson, Nancy Emery, Sylvie Brouder, Tamara Benjamin)
- **Dr. Claudio Andrés Toro Aedo,** University of La Frontera: *Nitrogen adsorption on biochar: A preliminary study* (co-authors: Diez M. C., Navia R., María Eugenia Gonzalez)
- **Lars Hylander,** Uppsala University: *Treatment of greywater and wastewater with charcoal* (co-authors: Sahar Dalameh, Benjamin Reynolds, Håkan Jönsson, Björn Vinnerås, Mikael Pell, Ingrid.Oborn, Folke Günther)
- **Joseph Kimetu,** University of Calgary: *A role for biochar in waste water processing in the petroleum sector* (co-authors: Layzell DB, Hill J, Harding TG, Abedi J, Husein M)

Parallel B: Climate Change Effects of Biochar Sala Guaratiba

- **Lena Perkins,** Stanford University: *Exergy analysis of woody plant biomass torrefaction*
- **Lukas van Zwieten,** Industry and Investment NSW: *Influence of biochars on flux of N_2O and CO_2 from amended ferrosol* (co-authors: S. Kimber, S. Morris, A. Downie, E. Berger, J. Rust)
- **Massimo Valagussa,** MAC "Minoprio Analisi e Certificazioni S.r.l.": *Chemical-physical characterization and bioassay on poplar and conifer biochars* (co-authors: Alessandro Pozzi, Alberto Tosca)

Parallel C: Biochar Soil Fertility and Systems Analysis Sala Mar Azul

- **Mellissa Ananias Soler da Silva**, Embrapa Rice and Beans: *The effect of charcoal amendment on soil physical properties related to water retention in the Brazilian savanna (Cerrado)* (co-authors: Beata Emoke Madari, Heliton Fernandes do Carmo, Fabiano André Petter, Orlai Moreira da Silva, Diogo Milhomem Machado, Márcia Thaís de Melo Carvalho, Rafael Faria de Otoni, Fernando Cunha Freitas, Raphael Oliveira de Souza)
- **David Friese-Greene,** Soil Fertility Project: *Soil fertility project in Southern India - banana farmers can't be wrong!* (co-author: James Bruges)
- **Dorisel Torres Rojas**, Cornell University: *Biomass availability, energy consumption and biochar production in rural households of Western Kenya* (co-authors: Johannes Lehmann, Stephen Joseph, Johannes Dietz)
- **Paul Taylor/Paul Anderson,** Chip Energy Inc: *CHAB micro-gasification for 1Gt CO_2/yr mitigation-sequestration: A quantitative analysis for practical decentralized low-cost results before 2020* (co-authors: Paul O. Taylor, Paul W. Wever)

12:30-13:30 Lunch

13:30 – 15:00 Session 7: Plenary: Biochar production Salão Itaipú

- Keynote: **Antony Bridgwater**
- **Ondrej Masek,** UKBRC and University of Edinburgh: *Influence of biochar production conditions on its structure, properties, and stability* (co-authors: Peter Brownsort, Andrew Cross, Saran Sohi)
- **Adriana Downie,** Pacific Pyrolysis/University of NSW: *Biochar industry risk assessment* (co-authors: Paul Munroe, Annette Cowie, Lukas Van Zwieten, David MS Lau)
- **Christoph Steiner,** University of Georgia: *Biochar use in the poultry industry* (co-authors: K.C. Das, Nathan Melear, Julia Gaskin, Casey Ritz, Keith Harris, Donald Lakly)

15:00 – 16:30 Session 8: Plenary: Commercialization Salão Itaipú

- Keynote: **Luca Montanarella**
- **Thomas Harttung,** BlackCarbon A/S: *The BlackCarbon Project: Pyrolysis/Stirling engine co-generation at micro scale (250-500 kW)*
- **Adriana Downie,** Pacific Pyrolysis/University of NSW: *Socioeconomic barriers to implementing biochar projects at commercial scale* (co-author: Tony Hunt)

- **John Gaunt**, Carbon Consulting LLC: *Biochar Offset Protocol Initiative* (co-author: Keith Driver)

16:30-17:00 Coffee break

16:30-19:00 Poster session II Salão Itaipú

WEDNESDAY, September 15

8:00 – 9:30 Session 9: Plenary: Quantification and Ecology of Biochar in Soil Salão Itaipú

- Keynote: **Evelyn Krull**
- **Janice Thies**, Cornell University: *The ecology of biochar in agricultural soils*
- **Claudia Maria B F Maia,** Embrapa Florestas: *The effect of biochar on the stabilization of soil-carbon in a highly SOM-depleted soil* (co-author: Saran Sohi)
- **Sander Bruun,** University of Copenhagen: *Factors affecting stability of biochar and effect of biochar on stability of soil organic matter* (co-authors: Tarek El-Zalery, Sofie Clauson-Kaas)

9:30 – 10:40 Session 10: Plenary: Terra Preta de Indio Salão Itaipú

- Keynote: **Siu Mui Tsai**
- **Gaspar Morcote-Ríos**: *Las Terras Pretas de la Pedrera (Amazonia Colombiana)*
- **William Woods**

10:40-11:00: Break

11:00 – 12:30 Session 11: Plenary: Climate Change and Biochar Salão Itaipú

- Keynote: **Saran Sohi**
- **Annette Cowie,** University of New England: *Is biochar carbon negative? Quantifying the climate change mitigation benefits of biochar*
- **Thea Whitman,** Cornell University: *Climate change impact of introducing a biochar cook stove to Western Kenyan farm households: a system dynamics model* (co-authors: Dorisel Torres, Chuck Nicholson, Johannes Lehmann)
- **Juergen Kern,** Leibniz Institute for Agricultural Engineering Potsdam-Bornim e.V.: *Greenhouse gas mitigation by different types of biochar* (co-authors: Jan Mumme, York Neubauer, Shumon Chakrabarti)

12:30-13:00: Closing Ceremony Salão Itaipú