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CHINA LEADER IN GREEN AGRICULTURE FIGHTING CLIMATE CHANGE WITH BIOCHAR

The People's Republic of China today is an on-going, unprecedented global experiment that challenges past notions and indicators of development. The second largest economy in the world, it is also the world's largest emitter of greenhouse gases (GHGs), though its per-capita emission-intensity does not appear within the first 70 GHG emitting countries. Nevertheless, China has committed to reducing its CO₂ emissions by 40-45 % and its ammonia nitrogen and nitrous oxide by 10 % in 2020, compared to 2005 levels (Gaoli, 2014).

While China's efforts to reduce GHGs have thus far been focused mainly on the industrial and energy sectors, it has also taken the global lead in the research and development of biochar, a valuable soil amendment obtained by converting agricultural waste through a pyrolysis process.

China's growing interest on biochar applications and its significance to green agricultural development were very much in evidence at the 2nd International Conference on "Biochar and Green Agriculture" (BioGra2015), convened on April 14-18, 2015 at the Nanjing Agricultural University.

Professor Genxing Pan of the Nanjing Agricultural University, China's premier biochar authority, and his team were the principal hosts of the conference together with the Shenyang Agricultural University and the Jiangsu Collaborative Innovation Centre for Solid Organic Waste Reutilization. The National Natural Sciences Foundation, Ministries of Agriculture and Education and the State Administration for Foreign Expert Affairs (SAFEA) of China were the main sponsors of the event.

BioGra2015 attracted international experts from more than 20 countries including representatives of organizations that globally advocate the increased application of biochar for poverty reduction, improving agricultural productivity, climate change mitigation, and adaptation such as the *International Biochar Initiative* (IBI) and Pro-Natura International.



Nanjing Agricultural University



Prof. Genxing Pan at BioGra2015



Dr. Natarajan Ishwaran, Pro-Natura, at BioGra2015

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The breadth and depth of the presentations from Chinese as well as international experts clearly demonstrated the case for stepping up the role of biochar in green agricultural development, generating simultaneous benefits for rural energy and enterprises development, climate change mitigation and improved agricultural yields, particularly in degraded, dry and semi-arid soils.

Professor Genxing Pan and his team have been researching and advocating greater use of biochar in China for a decade, during which they have developed several biochar products from straw and other agricultural residues for applications in energy production, fertilizer industry, crop-yield improvements and land remediation. Straw burning is a widespread practice among farmers in China and the Chinese Government has recently prioritized minimizing greenhouse gases emissions from biomass burning in the agricultural sector. As Professor Pan explained during his presentation, the problems in converting straw to biochar products has been the lack of incentives for collection of farm residues and how to bring them to a central point for conversion into biochar products.

The list of institutions researching biochar include Shenyang Agricultural University, Zhejiang University, Zhejiang Agro-Forestry University, Nankai University, Shanghai Jiaotong University, China Agricultural University, Northwest Agro-Forestry University, Fujian Agricultural University, and many provincial academies of Agricultural Sciences as well as China's Soil Science Institute and Urban Environment Institute.

What many Chinese researchers well understand is that only 12 % of China's 9,560,900 sq.km area (i.e. 1,147,308 sq.km), that is shrinking by the day, is arable and that China needs to sustain 1,200,000 sq.km of agricultural land to ensure food security. As its agriculture moves west into more semi-arid and arid parts of its own territory, and further into Central Asia as part of its Silk Road Economic Belt (SREB) strategy, improving productivity of arid and marginal soils will become an increasing demand and challenge.

There is also a growing awareness that migration of rural labour, a significant driver of the rapid growth of the Chinese economy for over three decades, may have peaked and is starting to slow down. Biochar has a significant contribution to make in ensuring that future growth in China is based on green and low-carbon agricultural and land-use development pathways.

During the BioGra2015 conference, Pro-Natura International, in partnership with the Sino-European Cultural Development Forum, announced that it is organizing a side-event to promote the application of biochar during the Conference of Parties to the UN Framework Convention on Climate Change (COP21) that will convene in Paris during the first two weeks of December 2015.



Rotary kiln for straw pyrolysis



Fast pyrolysis tower



Granular biochar compound fertilizer

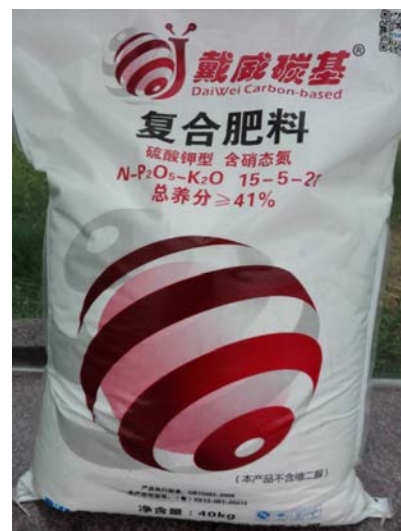


Speakers at the side-event will include Professor Genxing Pan as well as Venerable Dr. Michel Thao Chan (SEDFC, Greater China), Professor Jean Jouzel, Vice-President of IPCC and winner of the Nobel Peace Prize, Professor Johannes Lehman of Cornell University, New York and past president of the *International Biochar Initiative* (IBI) and Mr. Guy Reinaud, president of Pro-Natura International and member of the Board of IBI. Pro-Natura is awaiting confirmation and will inform all Pro-Natura Newsletter readers of the date and time of the side-event soon after.

UNFCCC COP21 is expected to be a landmark occasion as State Parties to the convention are expected to agree on a follow-up to the Kyoto Protocol whose first phase of implementation ended in 2012. Since 2012, land-use based climate change mitigation and adaptation initiatives such as UN-REDD have gained prominence and the importance of soil as a carbon sink has received increasing recognition under Sustainable Agricultural Land Management (SALM) initiatives.

SALM entered the voluntary carbon-market arena in 2011 and in the California Emissions Trading Scheme (that came into effect in 2012). Methodologies for avoiding emissions from agriculture, including through offsets in favour of reduced use of nitrogen fertilizers have been approved (Bell et al., 2014).

Pro-Natura hopes that the UNFCCC COP21 side-event it is organizing will generate new impetus to significantly enhance the applications of biochar in climate change mitigation and adaptation, improved agricultural productivity, food security and enhancing rural energy and business sector development in the next decade. ■



Biochar based fertilizer



Specialist biochar mixtures

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