

Update

July - September 2014 (No 20)

Work in Progress

SAIN catchment science knowledge exchange workshop held in the UK

The Sino-UK Catchment Science Knowledge Exchange Workshop was held on 10-11th September in the Lake District, UK.

Over 20 participants from Agro-Enviromental Protection Institute, China Agricultural University, Northwest A&F University, SOAS, Lancaster University, Plant Nutrition Consulting, British Geological Survey, University of East Anglia, and Defra DTC Secretariat attended the workshop.

The participants at the workshop exchanged the research progress on catchment policy and governance, catchment-scale substance flow analyses, nutrient and catchment science, mitigation of diffuse water pollution from agriculture, diagnostic approaches to catchment sciences, nutrient management in solar greenhouses, technical and institutional constraints to diffuse water pollution management. Participants also discussed the lessons and next steps for collaboration and continued knowledge exchanges.

The Chinese delegation also visited Eden DTC and British Geological Survey.

This workshop is part of the activities of project *Knowledge, Policy and Practice for Sustainable Nutrient Management and Water Resources Protection in UK and Chinese Agro-ecosystems*, jointly funded by the Department of Environment, Food and Rural Affairs (Defra) of the UK and Chinese Ministry of Agriculture.



UK-China Sustainable Agriculture Innovation Network (SAIN)

Biochar project meeting held

Led by Prof. Zhao Lixin, the Chinese members of SAIN biochar project team visited the UK on 8-9th July, and held meeting with the UK team leader, Dr John McDonagh of University of East Anglia. The project team reviewed the project progress and discussed the forthcoming activities with Chinese colleagues. Prof Zhao and her colleagues also visited the Combined Heat and Power (CHP) systems on the campus of University of East Anglia.



This visit is part of the activities of project *Biochar: Socio-Economic and Biophysical “Fit”*, funded by DFID of the UK government and Chinese Ministry of Agriculture.

Publications

David Powlson, David Norse, David Chadwick, Yuelai Lu, Weifeng Zhang, Fusuo Zhang, Jikun Huang, Xiangping Jia, **Contribution of improved nitrogen fertilizer use to development of a low carbon economy in China**, *World Agriculture Vol. 2, No. 2, pp 10-18*

The use of nitrogen (N) and other fertilisers has been one of the keys to achieving food security in China. Grain production almost doubled in China between 1980 and 2010, yet total fertiliser use increased more than four-fold in the same period. This disparity is partly due to changes in cropping, with a large increase in the area devoted to horticultural crops (vegetables and fruit trees) that are given large rates of fertiliser, especially N. But it also reflects the extremely high rates of N application given to a wide range of crops, including cereals. There is overwhelming evidence that rates of N applied to many crops in many regions of China are greatly in excess of the rates required to achieve maximum economic yield. These excessively high rates, combined with inappropriate fertiliser management practices such as timing and method of application, have led to very inefficient use of N and considerable losses to water and air with numerous adverse environmental impacts. A key reason for much of the inappropriate fertiliser management is that many farmers are part-time, with more lucrative income from off-farm work. Thus farm operations are given a low priority, with little incentive to change practices if these involve additional costs, or labour, that interferes with the off-farm work. In this article we review the current situation regarding N fertiliser in China, with an emphasis on the reductions in greenhouse gas emissions that are achievable through changes in both manufacturing and agricultural use. We argue that, although technical innovations have a role, these are only likely to be widely adopted in practice if policy changes are implemented to promote changes in fertiliser manufacturing and on the farm. Necessary changes in policy include changes to the subsidy, originally developed to make fertilisers affordable to farmers in the period before rapid economic development in the country. At the farm level, policies to promote greater professionalism in farming through increasing the size of farms will facilitate more rational use of N. This is possible as large numbers of former farmers move to other work in cities; the Chinese government has policy initiatives in this area through changes in land rental arrangements. Another welcome change would be measures to promote more farmer-oriented approaches to the delivery of technical advice such as the farmer field-school approach, and development of a contractor sector for fertiliser application.

UK-China Sustainable Agriculture Innovation Network (SAIN)

Shelagh Kell, **Plant diversity in China vital for global food security**, *China Dialogue*, 17, September 2014

Modern farming and production techniques, consumer demand and large-scale retail industries have all contributed to the need for greater uniformity in our crops. The downside of this is a decline in genetic diversity and greater vulnerability to pest and disease outbreaks and environmental stresses.

Using previously published works on the flora of China (namely the China Checklist of Higher Plants and China Red List of Biodiversity), combined with data and knowledge generated in studies previously undertaken in Europe, our research has revealed more than 800 wild plant species native to China that are of potential use to adapt 28 nationally and globally important food crops to withstand the detrimental impacts of climate change.

Notably, 42% of these species occur nowhere else in the world and at least 17% are highly threatened by agro-forestry, infrastructure development and other forms of habitat loss and degradation. This includes wild relatives of 16 crops that are globally threatened because they do not occur anywhere else in the world.

With more plant species than Europe and CWR of globally important food crops, China's position as a provider of plant genetic resources for crop improvement is crucial to us all globally. Now that we have identified China's priority CWR and some of the hotspots in which they occur, authorities and stakeholders in China urgently need to develop and implement a conservation strategy to secure their future.

Conference Announcement

The 5th International Symposium on Ecologically Sound Fertilization Strategies for Field Vegetable Production (ISHS2015), Beijing, May 18-22, 2015

Symposium Topics

- Crop growth, nutrient physiology and demand
- Soil testing and nutrient recommendation
- Organic amendments, soil fertility and health
- Fertilization and product quality
- Fertilization and eco-environment
- Root zone regulation and Fertigation
- Organic waste recycling utilization and sustainable development

For further details, please visit:

<http://ishs2015beijing.csp.escience.cn>

For more information about SAIN, please visit: <http://www.sainonline.org/English.html>

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