

Rothamsted International

Sharing research excellence for agriculture in less developed countries

December 2006

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If you have any items which could be included in future Newsletters, then please contact Paresh Shah at Rothamsted International.



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Welcome to the redesigned Newsletter!

We hope this new version of the newsletter will help communicate the full range of our activities and interests.

Rothamsted International works with partners around the globe to build capacity in the agricultural sciences for the benefit of less developed countries. Rothamsted Research, which is the world's oldest agricultural research centre, is our principal UK partner.

Our key activities are managing Fellowships, coordinating projects to benefit rural communities and providing support and advisory services.

The articles in this Newsletter may hopefully provoke thought on some of the practical steps needed to improve agriculture through international cooperation in science and capacity building, and we would be interested in hearing your views.



The Rothamsted International display at the Rothamsted Open Weekend held in October

Rothamsted International Fellowship Scheme

Since 1993, over 100 awards have been made to scientists

Rothamsted International Fellowships are funded by charitable donations. By carrying out advanced research and training at Rothamsted, Fellows from less developed countries gain new skills and create strategic partnerships, thus building capacity between their home organisations and Rothamsted.

Described below are outlines of projects by current Rothamsted International Fellows.

Lucila Gomez Gil, from CENSA in Cuba, has been working on environmentally friendly ways of controlling nematode pests which feed on roots of crops. Prof. Brian Kerry has a long-standing collaboration with CENSA to develop the fungus *Pochonia chlamydosporia* as a biocontrol agent. Lucila studied the nutrition of *Pochonia* and its interaction with cyst nematodes and crops in the soil. She also received training on how to identify root-knot and cyst nematodes using visual and biochemical techniques and how to extract cysts from soil.

The Fellowship for **Dr Mumuni Abudulai**, from the CSIR-Savanna Agricultural Research Institute in Ghana, comprised two parts. He started with a two month visit to ICIPE in Kenya, hosted by Dr Zeyaur Khan, to obtain practical experience in implementation of the "push-pull" insect and weed control strategy* which was devised in collaboration with chemical ecologists at Rothamsted.

Dr Abudulai then spent six months at Rothamsted, where he carried out laboratory and field studies with Dr Sam Cook and colleagues on the possibility of inducing plant defence mechanisms to enhance a push-pull strategy against insect pests of oilseed rape.



Dr Mingsheng Fan from the China Agricultural University has been working on the effects of different agricultural practices on selenium and other micronutrients in crops such as wheat. Interestingly, his work with Prof. Steve McGrath and Dr Fangjie Zhao shows that introduction of short-straw wheat varieties in the late 1960's has resulted in a decrease of some micronutrients, potentially reducing its nutritional benefits. This can be seen as an unintended consequence of the accelerated cereal breeding programmes which underpinned the "Green Revolution" of the 1960's and 1970's.

Dr Xiaorong Zhao, from the same university as Mingsheng, has been working with Prof. Phil Brookes to compare microbial activity in Chinese paddy soils and UK arable and grassland. Her results indicate that microbial carbon and phosphorus decline when soils are wetted to simulate flooding or waterlogging. This will provide an insight into the processes by which phosphorus can leach from soils and possible ways of preventing the pollution of watercourses from agricultural systems.

*The Quiet Revolution: Push-Pull Technology and the African Farmer. The Gatsby Charitable Foundation, April 2005.

Rothamsted International Fellowship Scheme

Fellowship Alumni

We start this section with the sad news that **Dr Imran Siddiqi** died suddenly in August 2006. Imran had been a Rothamsted International Fellow with Prof. Brian Kerry between 2004 and 2005. On hearing the news, Brian said "He will be remembered as an enthusiastic and energetic young scientist who was clearly establishing himself at the forefront of nematology in Pakistan".



Dr Imran Siddiqi

Belkis Peteira, (2004-2005) was awarded a PhD after returning to the CENSA research institute in Cuba, and her thesis included some of the research work on using molecular techniques to identify nematode pests in soil.

Also in 2006, **Deying Ma** (2005-2006) obtained her PhD from Xinjiang Agricultural University in China for studies on the resistance of white fly strains to different insecticides.



Deying Ma at her graduation

Charity fundraising and donations

Rothamsted International is continually searching for funding from charities, trusts and foundations to help finance the Rothamsted International Fellowship Scheme, which was started in 1993.

The vast majority of our donors are in the UK, and they range from individuals and small family trusts to large foundations and businesses. We would like to say "thank you" to all of our past and current donors. As we hope you can see from this newsletter, your contribution is being used well.

Future activities

As the profound impacts of climate change are steadily being acknowledged by politicians, it is necessary to increase research into the impacts of global warming upon all aspects of agricultural practice and land management.

Accordingly, Rothamsted International is approaching several major international philanthropic organisations to explore possibilities for collaboration. This may, for instance, take the form of home country-based schemes, rather than direct funding of Fellows, so watch this space for developments!

Efforts to support the established Fellowship Scheme will continue unabated, so do not be surprised if an information pack and a request for future funding arrives in your post!

So far 117 Fellows from 30 countries have been able to carry out studies at Rothamsted, and their newly acquired skills and knowledge have greatly benefited the home organisations they work for.

If you would like to make a contribution to the work of Rothamsted International, then please contact our office.

Again, thank you!

African Fellows Programme

Started in 2004 the programme has so far funded 19 African scientists

African scientists gain access to scientific expertise through these Fellowships to help provide practical solutions for problems in African agriculture. Research projects are undertaken in the UK as well as other European countries such as Belgium, Germany and Sweden. Funding is provided by the Gatsby Charitable Foundation.

Applications are made in two stages: pre-proposals are assessed, and then selected candidates are requested to submit full proposals with European partners. These are reviewed by an external panel on factors such as science quality, capacity building and ability to improve African smallholder agricultural systems.

Over 500 pre-proposals have been assessed in the past two years. The fifth call for pre-proposals closed in June 2006, and the following statistics were compiled from the applications:

- median age was 36 years, varying from 22 to 50
- 22% of pre-proposals were from women
- 25% of pre-proposals were from Nigeria
- 25% of research topics were on crop protection and 24% on livestock

Further information on this programme can be found on our web site at www.rothamsted-international.org/

African Fellowships completed in 2006

Dr Valente Aritua, from Kawanda Agricultural Research Institute, Uganda, worked with Dr Julian Smith, Central Science Laboratory, UK, on developing molecular techniques to identify the bacterial strains which cause Banana Bacterial Wilt, an important disease throughout central Africa infecting both cooking and dessert bananas.

Dr Achille Assogbadjo from the University of Abomey-Calavi in Benin, studied the genetic variation in baobab trees which will help to conserve these multi-purpose trees. The research was done with Prof. Patrick Van Damme of the Laboratory of Tropical and Subtropical Agriculture and Ethnobotany, Ghent, Belgium.

Caroline Kadu, from the World Agroforestry Centre (ICRAF), Nairobi, Kenya, has developed molecular markers for *Allanblackia*, a high value tree crop being promoted in agroforestry systems for small-scale farmers. The work has been done with Dr Joanne Russell of the Scottish Crops Research Institute in Dundee.

Dr Ndack Ndeye Diop, from Centre d'Etude Régional pour l'Amélioration de l'Adaptation à la Sécheresse, Senegal, carried out a short study with Dr Anne Repellin at the University of Paris XII on identifying and isolating some of the genes responsible for drought tolerance in cowpea.

Dr Hortense Diallo (right), University of Abobo-Adjame, Côte d'Ivoire, did her project at Rothamsted Research in order to identify the different viruses infecting papaya trees.

From studies using electron microscopy, biochemical and molecular techniques, Hortense and Prof. Phil Jones have characterised many of the viruses, and are preparing several publications and an identification guide for scientists and extension workers



Research links with China

In April 2006, Prof. Ian Crute, Director of Rothamsted Research, signed two Memoranda of Understanding (MoU) with Chinese research organisations.

The first was with Northwest Agriculture and Forestry University in Yangling, and covered cooperation through joint research proposals and training exchange visits.

The second MoU was with the Institute of Oil Crops Research of the Chinese Academy of Agricultural Sciences in Wuhan, and emphasised joint collaboration in Brassica genetics, diversity in crop diseases and crop nutrient uptake.



Prof. Ian Crute in Wuhan

Awards for Rothamsted Pathologist

Also in April 2006, Prof. Bruce Fitt from the Plant-Pathogen Interactions Division received a Hubei Province "Chu Bell" award in Wuhan and an Honorary Professorship from Inner Mongolia.



Prof. Fitt with colleagues in China

Biocontrol in Latin America

Scientists working on the European Union-funded project '**M**icrobial pest **C**ontrol for **S**ustainable urban and **P**eri-urban **A**griculture in Latin America (MiCoSPA) held their final meeting in June 2006 in Costa Rica.

Members of the project consortium, including partners in Cuba, Mexico, UK, Italy and the Netherlands, summarised all of their research outputs from studies done in the previous four years, and they discussed ways of disseminating findings that will be useful to farmers and advisory services.



Field trials in Mexico

The project was led by Dr Judith Pell (Plant and Invertebrate Ecology Division, Rothamsted Research) and considered several control strategies utilising naturally occurring fungi as biological control agents against insect and nematode pests in vegetables.

Laboratory work, principally in the UK, and field studies in Cuba and Mexico evaluated the effectiveness of different fungi against pests and the usefulness of uncropped areas as reservoirs of fungal natural enemies.

Scientists also developed mathematical models to predict the action and persistence of fungi used against leaf feeding insects and root feeding nematodes.

Developing new links in Brazil

In August 2006, Prof. John Lucas, Plant-Pathogen Interactions Division, visited several public and private sector organisations in Parana State.

During talks with IAPAR (Institute for Agriculture), several areas for joint research were identified, such as bioenergy crops, natural products for plant protection and soil microbiology.

Funding sources which may help launch the collaboration are currently being identified.



Types of radish could be biofuels

Nematology network in Africa

The Nematode Initiative in Eastern and Southern Africa (NIESA) started in 2005 to produce a network of trained nematologists to carry out research into local root-knot nematode problems, and help provide scientific inputs for regional agricultural policy. Prof. Brian Kerry (Rothamsted Research) is the leader for the project.

During 2006, three students from Malawi and Tanzania completed the MSc course in Tropical Agriculture at the University of Reading, and are carrying on research projects in their home countries, while receiving further training at Makerere University in Uganda and at Kenyatta University and the University of Nairobi, both in Kenya.

Soybean research in S. Africa

The Legume Improvement project (LEGIM) is jointly funded by the Royal Society, UK, and the National Research Foundation (NRF) in South Africa. The project leaders are Prof. Christine Foyer (Crop Performance and Improvement Division, Rothamsted Research) and Prof. Karl Kunert of the University of Pretoria.

The aim of LEGIM is to understand how various stress factors, such as drought and low night temperatures, can cause senescence and death of the nitrogen fixing nodules in soybean. From this work, it is hoped that improved varieties will be made available for farmers to use.

Coupled with the research are training programmes, including courses for lecturers and MSc students from the University of Limpopo, on soybean transformation and basic molecular biology work.



During 2006, further funding was obtained for the project, including money for a "5+5" workshop in Pretoria to discuss future grant applications. In addition, three members of the LEGIM team carried out study visits to work with Christine Foyer at Rothamsted Research.

Peter Lilley MP visits Rothamsted



Peter Lilley with international scientists

In September 2006, Peter Lilley, Member of Parliament for Hitchin and Harpenden, visited Rothamsted International to learn about some of the research work and training activities being carried out by scientists from Africa, Latin America and Asia.

Mr Lilley is Chairman of the Globalisation and Global Poverty Group of the Conservative Party, and the visit was designed to obtain views on how British aid could be more effective in helping to improve agriculture in developing countries.

Talks were held with scientists from Rothamsted and from less developed countries, including several Rothamsted International Fellows.

After his visit, Mr Lilley commented "Agricultural research is crucially important to helping the developing world feed itself. Rothamsted has an outstanding reputation in this field and attracts scientists from all over the world. We should be proud such important work is being undertaken in our local area."

Local links

Talks about Rothamsted International were given to the Essex branch of the University of the Third Age and to Harpenden High Street Methodists group. However, much of the work with the general public this year has involved primary and secondary schools.

A presentation on the current status of GM crops in less developed countries was given to four secondary schools who visited Rothamsted to learn about plant biotechnology.

Dr Hortense Diallo (African Fellows Programme) and Dr Xiaorong Zhao (Rothamsted International Fellowship Scheme) gave presentations on their home countries and cultural backgrounds to primary school children in Berkhamsted and Harpenden.



Xiaorong at Grove Infants school

Rothamsted International is also involved in a grant funded by the Department for Trade and Innovation awarded to Challney School for Girls in Luton, which provides money for the secondary school children to travel to Rothamsted for specially organised talks and public meetings. This is intended to broaden their appreciation of agriculture and science and technology, which could perhaps influence future choices for higher education and careers.

Overseas delegations in 2006

During the past year Rothamsted International hosted several visits from less developed countries. These included:

Brazil	technology transfer companies
China	Anhui Province CAS Institute of Geographical Sciences and Natural Resources
India	Three researchers on soils and plant health
Libya	science and technology delegation
Mauritius	Mauritius Sugar Industry Research Institute
South Africa	Agricultural Research Council, Pretoria

Conference presentations

The highlight of the year was undoubtedly the posters and exhibits at the Rothamsted Open Weekend in September 2006, where about 10,000 members of the general public and 400 school children visited the laboratories in Harpenden and discovered more about the research being done at Rothamsted and work on sustainable agriculture throughout the world.

In September, we were involved in organising an information event at Rothamsted for the new BBSRC - DFID funding scheme aimed at increasing agricultural productivity and food security in Africa and Asia.

A poster was displayed in September 2006 at the Innogen Annual Conference held on genomics and development, partly organised by the Open University.

In November 2006, a presentation was made at a conference for investment by the African Diaspora to improve African agriculture through capacity building, held at the Commonwealth Secretariat in London.

In brief

China to share expertise with poorer nations

At least 3,000 Chinese scientists will work in rural communities in developing countries to help improve food security over the next six years. The arrangement is being made under South-South Cooperation Initiative between China and the UN Food and Agriculture Organization (FAO). Areas of cooperation include irrigation, agronomy, livestock, fisheries and post-harvest handling of agricultural produce.

SciDev.Net, 22 May 2006

China-EU Science & Technology Year (CESTY)

CESTY was launched in October 2006 to strengthen scientific and political links between China and European Union Member states and it will focus on collaborative scientific projects and researcher mobility. Areas of interest include renewable energy, environment, biotechnology, agriculture and food and animal health. The year coincides with the adoption and start of the EU Framework 7 Programme and the renewal of China's 11 Year Plan which has a strong research focus.

CESTY web site <http://ec.europa.eu/cesty>

India's partnerships with USA

In June 2006, India and the United States agreed to a "second generation" of cooperation in agricultural sciences, as part of discussions on science and technology. The main area of work will be on raising agricultural productivity under drought conditions, but there will also be studies on crop pests and diseases and methods to reduce post-harvest losses.

SciDev.Net, 25 July 2006

Brazil to help African agriculture

The Brazilian Agricultural Research Corporation (EMBRAPA) has signed agreements with Ghana and Botswana to share expertise in agricultural research.

The Council of Scientific and Industrial Research in Accra, Ghana, will act as a regional base. EMBRAPA staff will identify local research needs, plan studies that can be undertaken in Brazil, and seek research partners.

The agreement by EMBRAPA with Botswana is for a five year initiative aimed at technology transfer and training of researchers, concentrating on cattle husbandry and agricultural production in very arid areas.

SciDev.Net, 14 July 2006;

CropBiotech Update, 25 August 2006

Education and research in Russia

Russia intends to spend tens of millions of dollars on training students overseas starting from 2007. To help the mobility of students and researchers throughout Europe, Russia signed agreements with EU representatives in May 2006, so that visa procedures can be relaxed.

In June 2006, the UK announced a £1 million initiative to strengthen links between British and Russian higher education establishments. The money will be allocated through the Bridge program (British Degrees in Russia), jointly coordinated by the British Council and the National Training Foundation in Russia.

RIA Novosti, 26 May, June 1 2006