



# Rothamsted International

NEWSLETTER DECEMBER 2008

## 'Thought for Food' Rothamsted Public Open Meeting

### Science to help feed developing countries

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The current world food crisis has hit the world's poorest the hardest. The September Public Meeting was an appropriate time to highlight the work that Rothamsted Research does internationally in building the capacity of developing countries to increase their food security in the face of increasing environmental and economic pressures.

During this Meeting Dr Judy Mann (Rothamsted International) presented the two RI Fellowship schemes and an overview of the work that Rothamsted does internationally.

Current RI Fellow, Dr Haruna Braimah, presented a talk 'The sweet smell of death' about his work in BCH on senesced leaf odours as tools for management of the banana weevil, *Cosmop-*

*lites sordidus*. The evening was rounded off by Professor Brian Kerry who gave a presentation about his nematode research and capacity building in Africa and Cuba.



RI Fellow Dr Haruna Braimah from CSIR, Ghana

### World news affirms the importance of agriculture

Agricultural development as an engine for economic growth has been highlighted in the news this year.

The 2008 World Development Report, *Agriculture for Development*, first brought renewed attention on the role of agriculture as a catalyst for development. This annual publication of the World Bank, tackles a different development topic each year, and the 2008 edition was the first to address agriculture

in 25 years. It highlighted the role of science and technology for agriculture driven development.

In April, a report by over 400 scientists was launched by the International Assessment of Agricultural Science and Technology for Development (IAASTD). It said the way the world grows its food will have to change radically to better serve the poor and hungry.

In June, the UN Secretary General, Ban Ki-moon, urged nations to "seize an historic opportunity to revitalize agriculture" as a way of tackling the food crisis.

Rothamsted continues to play a key role in this area.



#### NEW WEBSITE

Rothamsted International has a newly designed website.

Please visit ~

[www.rothamsted-international.org](http://www.rothamsted-international.org)

~ and send us your comments.

# Rothamsted International



Maruthi  
Vegapareddy

## School visit

Pupils from the Challney High School for Girls in Luton were invited to meet our current RI Fellows. Each Fellow spoke to students about the work of scientists. The students enjoyed having the opportunity to learn about different countries and cultures, as well as the science.



Shengli Guo



Home locations of RI Fellows this year

## Fellowships supported this year

During 2008 we have welcomed eight new RI Fellows from across the world, encompassing a variety of agricultural disciplines.

Three projects have addressed insect problems in agriculture: Insecticide Resistance ~ Dr Chen Luo from China has studied mechanisms of resistance in *Bemisia tabaci*, the whitefly, and addressed management options for its control (with Dr Kevin Gorman in the PIE Department); Insect Chemical Ecology ~ Dr Haruna Braimah from Ghana has been identifying attractants from dead banana leaves for control of *Cosmopolites sordidus*, the banana

weevil (with Dr Mike Birkett in the BCH Department); and Insect Ecology ~ Dr Juan Aleman-Martinez from Cuba has researched the natural enemies of aphids (with Dr Judy Pell, PIE Department).

Two Fellowships have been in Soil Science: Dr Shengli Guo from China has modelled organic matter content of soils of the Loess Plateau for improved management practices (with Prof Phil Brookes, SSC); and Dr Maruthi Vegapareddy from India is assessing and modelling root growth patterns of sorghum varieties to optimize water and nutrient cap-

ture in drought conditions (with Prof Keith Goulding and Dr Goetz Richter, SSC).

One Fellowship was in Plant Disease diagnostics: Prof Karel Acosta-Perez from Cuba did molecular analysis of the causal agent of 'bunchy top symptom' that affects papaya for improved diagnosis and control (with Dr Yaima Arocha PPM). Another Fellowship was in agricultural statistics: Dr Zakaria Kehel from Syria analysed yield data for durum wheat under drought conditions for improved breeding (with Dr Dimah Habash-Bailey, PSC & Dr Sue Welham, BAB).



Zakaria Kahel



Chen Luo



Juan Aleman-Martinez

# Fellowship Scheme

## Summary statistics of RI Fellowships

Rothamsted International is 15 years old this year. It was initiated to celebrate the anniversary of 150 years of research at Rothamsted.

The first Fellowship was awarded to Dr Ulhas Dixit from Bombay University, India. He spent his Fellowship on a project developing methods of multivariate statistical analysis in the Statistics Department.

To date, Rothamsted International has supported 124 Fellowships

from 30 different countries. The average age of the Fellows is 36 years with a range of 23 ~ 56 years. Of these, 61 Fellows have come from China, India and Cuba.

The scheme aims to promote the exchange of vital scientific skills to help agricultural and environmental needs in developing and emerging countries and to assist in both individual and institutional capacity building. In many cases, collaboration has been maintained for further research projects, joint publications and partnerships.



*This year, VSNi gave two training courses to current RI Fellows on GenStat Discovery. This software package is provided free of charge by VSNi International to Fellows to take back to their home organisations.*



**Professor Karel Acosta-Perez**



**Darren Murray (VSNi, right) and RI Fellows on GenStat course**

## News from Alumni...

Dr John Agbenin was our 100th RI Fellow spending six months in 2004 on a Fellowship with Prof Steve McGrath studying toxic metals in soils. We are delighted to hear that he has recently been promoted to the rank of Professor at the Ahmadu Bello University in Nigeria.

Dr Fatima Jafun was an RI Fellow in 2001 with Dr Stephen Moss studying herbicide resistant weeds in Nigeria. She has recently remarried and is now

Fatima Sewa and she has also been promoted to the rank of Professor at Bauchi University.

Dr Murali Gopal, a recent Fellow in Soil Science with Prof Phil Brookes, returned home to be recognized, with his group, for work on vermicomposting of coconut leaf litter. The spread of its technology has had a positive influence on marginal poor farmers. Murali and his team received the ICAR Team Research Award in Delhi in July this year.



**Professor Fatima Sewa and Professor John Agbenin**

# RI African Fellowships



Gelagay Ayelet went to Pirbright Laboratory, Woking

*"I am happy to have been an AFP Fellow . It is a good programme that should continue for the benefit of Africa"*  
**Hortense Diallo**

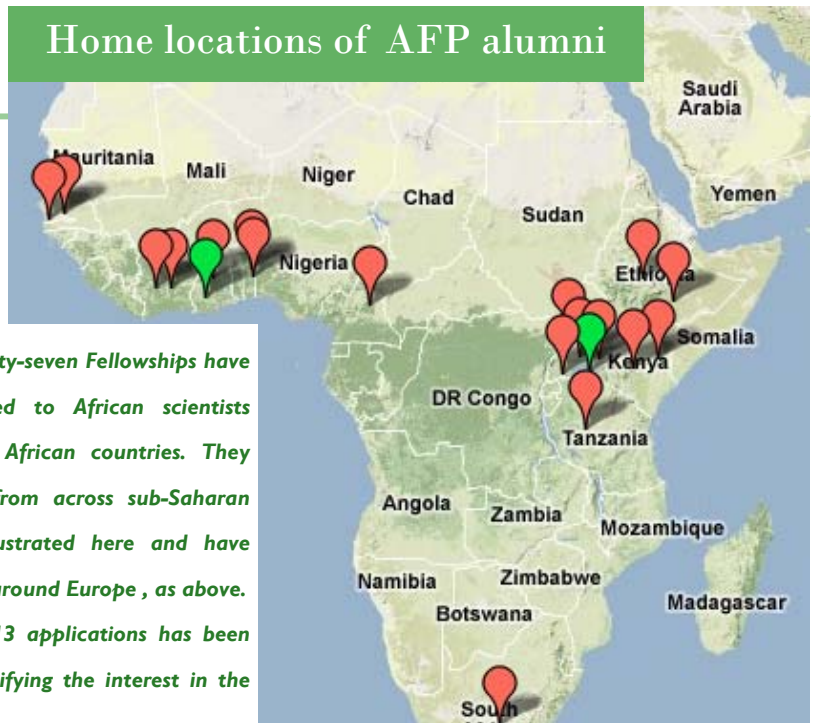
Robert Kajobe was at Central Science Laboratory, York



*The RI African Fellowship Scheme was established in 2004 to provide problem-focused training for mid-career African scientists in skills and technologies relevant to the agricultural needs of their countries.*



## Home locations of AFP alumni



*To date twenty-seven Fellowships have been awarded to African scientists from fifteen African countries. They have come from across sub-Saharan Africa as illustrated here and have been placed around Europe , as above. A total of 813 applications has been received, signifying the interest in the scheme.*

## What this means for Africa ~ making a difference

AFP Fellows are encouraged to participate in dissemination activities on returning home.

Some have held training workshops for their colleagues (such as Valentine Aritua and Josephine Nama-ganda), or discussed strategies with local communities and NGOs (such as Achille Assogbadjo in Benin). Others have presented advice on breeding programmes (for instance,

Bosco Bua and cassava breeding) or produced leaflets for small-scale farmers (eg Robert Kajobe in Uganda). Others have had direct contact with small-holder farmers (such as Edward Yeboah and his soils management strategies in Ghana ~ Edward also had results aired on local radio).

The long-term aim is to contribute to poverty alleviation and sustainable land use in

sub-Saharan Africa. This will have a positive impact in improving the economy of poor countries through exportation of healthy animals and their by-products, and food crops.

The AFP programme aims to help empower African countries to find their own solutions to problems of sustainable food security in sub-Saharan Africa and to catalyse long-term partnerships.

## Some Fellows supported this year

### Livestock

Dr Gelagay Ayelet from Ethiopia spent his Fellowship at Pirbright Laboratory, UK with Dr Mahapatra. He studied the serotypes and subtypes of foot and mouth disease (FMD) virus circulating in bovines in Ethiopia to help design appropriate control measures for this important disease. This will help poor Ethiopian farmers increase milk supply and improve the country's economy through exportation of healthy animals and animal by-products.

Dr Fufu Dawo is from Addis Ababa University, Ethiopia and is currently at the Federal Research Institute for Animal Health in Germany with Professor Grund. He is studying the molecular characterisation of Newcastle Disease virus (NDV) isolates in Ethiopia, an economically important disease of poultry. This aims to improve farmer livelihoods through increased chicken production.

### Crop protection ~ insects

Dr Robert Kajobe from Uganda worked with Dr Gay Marris at Central Science Laboratory, UK. He identified bee pests and diseases in different agro-ecological zones. A Pest & disease Surveillance Protocol was drawn up. Apiculture is a significant agricultural activity in Africa where honey and other bee-related

products are vital sources of food and income in poor communities.

Dr Sunday Oluwafemi from Nigeria has started a Fellowship at Rothamsted Research with Dr Mike Birkett. He is studying the control of leafhopper pests of maize by examining the impact of *cis*-jasmonate to induce expression of plant defence mechanisms. Maize can supply 50% of the calorific intake in sub-Saharan Africa but, in certain years, a farmer's entire crop can be wiped out by maize streak virus (MSV) transmitted by leafhoppers

### Crop protection ~ disease

Mr Mamadou Koutou from Burkino Faso will spend his Fellowship at the Swedish University of Agricultural Sciences with Dr Anders Kvarnheden. He will be studying the molecular characterisation of begomoviruses causing Tomato Yellow Leaf Curl Disease (TYLCD), a disease that is devastating tomato crops in many African countries. The need for such molecular characterisation is a key step for the development of resistant tomato varieties, as tomatoes are an important part of the diet in many African countries.



### Plant breeding ~ modelling

Mr Ekanao Tedihou from Benin is currently at the University of Aarhus with Dr Niels Holst. He is identifying and modelling the factors that influence *Aspergillus flavus* in maize. Consumption of contaminated maize is very dangerous and reduces export potential so there is a necessity to develop a forecast tool to anticipate periods of risk. More strategically, the model could also provide advice on the cultivation of resistant cultivars in agro-geographical zones of high risk.

Dr Frank Owusu-Ansah from Ghana spent his Fellowship with Professor Robert Curran at the University of Reading. He is aiming to provide the statistical foundations for a new cocoa-breeding programme for selecting clones with high yield and a low incidence of black pod disease. West Africa is the source of over 70% of global cocoa supplies and is thus an important source of cash for resource-poor farmers there. One third of Ghana's total population is dependant on cocoa for their livelihood.



Dr Charles Ssekya

## What an AFP Fellowship means for African scientists

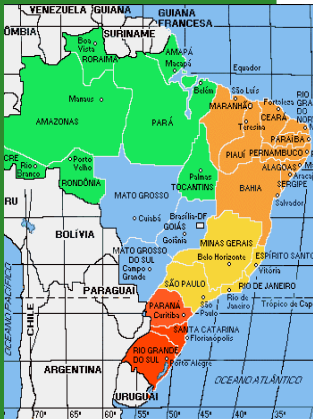
On return home scientists often receive professional acknowledgement. Dr Charles Ssekya, was appointed Director of Research at Uganda Martyrs University; Achille Assogbadjo has been granted the Ebi Kimanani Fellowship Award for his work on the domestication of the baobab tree, better use of a species for the benefit of local people; Dr Nazaire Kouassi was promoted to Head of the Biotechnology programme of CNRA. In addition to new skills, Fellows receive improved networking and publications in high impact journals.



Dr Bosco Bua at Rothamsted  
(AFP Fellow in 2007)

# Rothamsted Research projects with links

## Brazil - Labex Embrapa



Brazil regions

Embrapa, the Brazilian Agricultural Research Corporation, is expanding its project Labex-Europa and is assigning a senior scientist to the UK at Rothamsted Research. This resulted from missions by Rothamsted scientists to Brazil in March 2007 (during the UK-Brazil Year of Science) and Spring 2008 and from Embrapa to the UK in May this year.

The main research focus of the Labex scientist placed here will be the interaction of plants with micro-organisms / insects, in particu-

lar the elucidation of mechanisms at the molecular level. The scientist will also consolidate existing links between Rothamsted and Embrapa on semiochemical-based strategies for control of major insect pests affecting crops and livestock and promote new work in this area.

In addition to the selected scientists developing their area of expertise, they will also act to strengthen and widen the scientific and technological cooperation between Embrapa and UK scientists. This UK arm of Europe Labex

will develop programs of collaboration with other groups in Britain and track studies in areas considered by Brazil as major challenges, such as climate change.

Rothamsted International played a major co-ordinating role in developing scientific links with Brazil, through a series of RI Fellowships awarded to Brazilian scientists, alongside small link-funding (British Council, BBSRC-ISIS) awards to Professor John Lucas and Dr Mike Birkett.

Rothamsted Research currently has over 50 projects with links to developing and emerging countries



Dr Saran Sohi



Dr Edward Yeboah on field visit in Ghana



## Ghana ~ Biochar-based soil management strategies

Dr Saran Sohi of the Soil Science Department joined forces with a recent RI-AFP Fellow, Dr Edward Yeboah, when they made an exploratory visit to Ghana, funded by the Royal Society Networking Award. During visits to Wenchi, Ghana they learned how the partial burning of rotational "slash and char" typically doubles crop yields.

This is practised in agricultural margins meaning less encroachment on forest areas. The stabilisation of organic matter by charring prevents CO<sub>2</sub> release, builds soil carbon and increases water retention leading to more sustainable crop production.

This management strategy appears analogous to that of Amazonian populations whose prac-

tices over several millennia resulted in 'terra preta', the patches of deep black soil that are widespread in the Amazon. These soils seem to have permitted sustainable agriculture on otherwise unfertile soil. Lately they have been the focus of high impact research between Rothamsted and Cornell University.

A PDF report of this initial visit is available if requested.

# to developing & emerging countries

## Arsenic contamination in soils of Bangladesh & Asia

Professor Steve McGrath and Fangjie Zhao (Soil Science) started a collaborative 3 year project, funded by the BBSRC and DFID, to investigate arsenic contamination in soils of Bangladesh and Asia.

Soils irrigated with arsenic-contaminated groundwater accumulate arsenic to potentially toxic levels. This is particularly serious in soils under

irrigated rice due to the large quantity of water used making the arsenic readily available to plant roots under the anaerobic conditions in flooded paddy fields.

The project will characterise the genetic and soil induced variation in arsenic uptake, translocation and metabolism in rice with the aim of alleviating the contamination, and

thus decreasing the hazard in the food chain.

See the back page for news on a shipment of analytical equipment to Bangladesh.

***Dr Asaduzzaman Khan from Bangladesh has recently been appointed as a Rothamsted Fellow. He will arrive in January 2009 to work on arsenic research.***



Occupants of a typical bari dwelling in West Bengal and a local using a shallow tube-well

## China Partnering Award

Dr Jon West and Sarah Rogers visited China funded by a BBSRC China Partnering Award, furthering collaboration in the development of molecular diagnostic techniques in plant pathology. This partnership is with the Oilseeds Crops Research Institute in Wuhan and the Crops Research Institute in Anhui. They also visited the Inner Mongolian Academy of Agriculture and Animal Husbandry Sciences in Huhhot.

At Huhhot they signed an agreement on the establishment of a Sino-UK Laboratory Collaboration. They also had discussions in Beijing on the threat of *Leptosphaeria maculans* which, if it was introduced on imported seed, could jeopardize oilseed rape production in China.

Next spring, scientists from Wuhan and Hefei will visit Rothamsted for a workshop to train in *Sclerotinia* diagnostics.



Dr Jon West signing a Memorandum of Understanding

# Local links ~

## Funds raised for shipment of analytical machinery to Bangladesh



**GF-AAS machinery**

Rothamsted International co-ordinated an appeal to raise funds to send a GF-AAS analytical machine from Professor Steve McGrath (Soil Science Department) to scientists working to combat arsenic poisoning in Bangladesh. This is a naturally occurring problem exacerbated by an increase in modern shallow tube wells extracting contaminated water. The contamination is detected in rice and can lead to severe health problems.

Research into the problem is being carried out by Dr Rafiqul Islam of Bangladesh Agricultural University. He required a Graphite Furnace Atomic Absorption Spectrometer to analyse his own samples, some of which are currently being shipped to Rothamsted for analysis.



**Cheque presentation at Bangladesh Youth League**

Thanks to a fundraising effort by RI volunteer, Bill Bell, in the local area, sufficient donations have been received. Our success was featured by BBC TV Look East in June. Notably, a generous collection was made by the Bangladesh Youth League and Steve McGrath and RI staff were recently presented with a cheque at their Centre in Luton.

In addition, there were anonymous donations which will provide enough money to send vital support resources, in particular furnace tubes and a hydride generation kit which will greatly enhance the work of Dr Islam and his team at BAU. The machine is being tested and will soon be up and running to measure arsenic in water, rice samples and other food materials in Bangladesh.



### **Rothamsted International**

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We acknowledge our volunteers for their invaluable contribution to RI ~ Kathleen Howe, Bill Bell and Dudley Christian

### **School visit and 'podcast'**



Dr Murali Gopal, a recent RI Fellow, visited Greenway School in Berkhamsted to talk to school children about life in Kerala, India and his work on coconut litter and vermicomposts.

He also participated in a podcast recording session, seen here at Rothamsted, with school children. This is accessible on our new website 'schools' page.