

plant animal human health

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The newsletter of the Plant, Animal and Human Health Group

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agency such as FARM-Africa and a leading research institution such as NRI can be very powerful. Each partner brings their own perspective and makes a unique contribution to shaping the work. FARM-Africa has collaborated with NRI for many years now and have

found the partnership to be very rewarding. The involvement of NRI staff ensures that the work done is at the cutting-edge. Together we make an original contribution to knowledge that can be translated into real benefits to poor farmers and livestock keepers." We also attach great importance to the

partnership with FARM-Africa and look forward to many years of continued collaboration in the future.

For further information, please contact: Steve Torr, e-mail: s.torr@gre.ac.uk ■

Our Team of Specialists



Dr. Steve Belmain
Pest Ecologist



Dr. Gabriella Gibson
Medical Entomologist



Dr. Phil Stevenson
Analytical Plant Chemist



Dr. Peter Burt
Aerobiologist



Dr. John Holt
Quantitative Biologist



Dr. Susan Seal
Molecular Plant Pathologist



Dr. Tim Chancellor
(Group Leader)
Vector Entomologist



Dr. Lawrence Kenyon
Plant Pathologist/
Virologist



Dr. Steve Torr
Medical Entomologist



Prof. Robert Cheke
Applied Ecologist



Dr. James Legg
(Uganda-based)
Vector Entomologist



Katy Oliver
Administrator



Dr. John Colvin
Plant Virus
Epidemiologist



Dr. Maruthi Midatharahally
Vector Entomologist



Dr. Mark Downham
Pheromone
Entomologist



Dr. Don Reynolds
(Visiting Fellow)
Entomologist

Prof. George Rothschild
(Emeritus Professor)
Research Advisor

Prof. Mike Thresh
(Visiting Professor)
Plant Virus Epidemiologist

Recent PhD awards

Since the last Newsletter was published a total of ten students have completed their PhD's: Shazia Aslam (Pakistan), Bill Crooks (Canada), Reju D'Cunha (India), Amy Doherty (UK), Tibebe Habtewold (Ethiopia), Thamara Jayasekara (Sri Lanka), Bob Odle (UK), Chowda Reddy R.V. (India), Poonam Sharma (India), Tiziana Ulian (Italy). PhD students make an important contribution to our research for development and in many cases we maintain strong

collaborative links when they return to their respective institutions. This also helps to build capacity in partner organisations.

For further information on research degree programmes at NRI please see our website at: www.nri.org/study/study ■

A partnership approach is fundamental to the way NRI operates as we strive to achieve our goal of improving the lives of people in developing countries. Some of our research partnerships are long-standing and have allowed us to contribute to solving the priority problems of national agricultural programmes over an extended period of time. Others are relatively new and reflect the emergence of important new players in the agricultural research and development continuum.

In this issue we describe the partnerships which operate in selected Plant, Animal & Human Health group research projects in Africa and Asia. As George Rothschild notes in his accompanying 'Opinion Piece', these projects are demand-led and draw on complementary inputs from several partner organisations. Wherever possible, we aim to use such partnerships to help build capacity in local institutions and to facilitate the uptake and wider adoption of research outputs ■

Dr Glyn Vale is new Visiting Professor

We are delighted at the recent appointment of Dr Glyn Vale as a Visiting Professor of the University of Greenwich. We have a close and long-standing collaboration with Glyn, who pioneered the use of bait technologies to control tsetse (*Glossina spp*) in Africa. Tsetse transmit trypanosomes which cause 'sleeping sickness' in humans and 'nagana' in cattle. Each year there are about 50,000 recorded cases of human sleeping sickness and the animal disease is estimated to cost Africa ~\$4.5 billion/year.

Glyn was a research entomologist at the Tsetse and Trypanosomiasis Control Branch of the Department of Veterinary Services in Zimbabwe for 24 years, working initially as a researcher, then leader of the research group and finally head of the Branch. Subsequently, he was research co-ordinator for the European Union-funded Regional Tsetse and Trypanosomiasis Control Programme for Malawi, Mozambique, Zambia and Zimbabwe for ten years before taking

up a variety of assignments as an independent consultant. Glyn currently holds several advisory posts including Committee Member of the African Union's Pan-African Tsetse and Trypanosomiasis Eradication Campaign. PAHHG's Steve Torr has worked with Glyn for nearly 25 years and they are currently working on methods of improving the cost-effectiveness of using insecticide-treated cattle to control vector-borne diseases (see PAHHG newsletter 1) and developing interactive programmes to help people design and implement tsetse control operations. To see examples of this work, visit the website www.tsetse.org ■

New editorship

In January of this year, Gay Gibson took over as editor (Medical Entomology) of the Journal Medical & Veterinary Entomology.



Photo courtesy of Andrew Martin at Rothamsted Research

The Waggle Dance

PAHHG's Don Reynolds has contributed to a research study which shows that honeybees 'recruited' by the so-called 'waggle dance' are able to translate the code in the dance into flight directions to their destinations. Using tiny harmonic transponders weighing only a few milligrams which were tagged to the insects, their flight trajectories were recorded as they were released from the hive. The findings of the research vindicated the long-held hypothesis of Karl von Frisch that bees recruited by the waggle dance use the information encoded in it to direct them to a remote source of nectar. The results have been published in the Journal Nature (Volume 435, 12 May 2005) ■

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About PAHHG

The Plant, Animal and Human Health Group (PAHH) comprises a multi-disciplinary team of researchers at the Natural Resources Institute (NRI) of the University of Greenwich. Disciplinary skills include *entomology, vector ecology, integrated pest management, plant pathology, virology, molecular biology, biodiversity, plant chemistry, post-harvest technology, aerobiology, pest migration, mathematical modelling and systems modelling*. We work with partners in many different countries in Africa, Asia, Europe and Latin America. Our work supports NRI's mission to improve the quality of life of the rural and urban poor and to contribute to the achievement of the Millennium Development Goals.

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A standard methodology to assess the potential risks from non-native species to the environment

In response to a key recommendation from the Department for Environment, Food and Rural Affairs (Defra) Review of Non-Native Species Policy, Defra funded a one-year project starting in January 2004 to develop a scheme for assessing the risks posed by any non-native organism to species, habitats or ecosystems in all or part of the UK.

The project benefited from the unique breadth of expertise available from a consortium of six UK institutes / universities enabling the direct utilisation of state of the art national and international research and practical experience in the assessment and management of invasive non-native species. Rob Black (Law), Peter Glaves (Earth & Environmental Science) and John Holt (PAHHG) constituted the University of Greenwich part of the consortium.

The work provided the first structured framework for evaluating the potential for any non-native organism, whether intentionally or unintentionally introduced, to enter, establish, spread and cause significant impacts in all or part of the UK ■

For further information contact: John Holt, e-mail: j.holt@gre.ac.uk; see also: www.defra.gov.uk/wildlife-countryside/resprog/findings/non-native-risks

Malcolm Iles and Jon Venn retire

Since the last issue of this Newsletter, two members of the group have taken a well-earned retirement. However, Malcolm Iles (Agricultural Economist) and Jon Venn (Computer Applications Specialist) are still making an active contribution to our research activities through inputs to ongoing projects. We greatly value their continuing involvement in our work! ■

New short-course on GM Biosafety

NRI is offering a new three-week course on GM Biosafety. The course is run by staff based at the Natural Resources Institute and the Law Department of the University of Greenwich and aims to provide independent advice on regulatory issues concerning the introduction of GM plants from Importation, Containment, and Testing to Release.

The course goes through knowledge-building in these areas followed by case studies to put the knowledge into practice, and highlights suitable strategies to ensure safe and sustainable use of GM crops. The

three-week course will be launched in November 2005. It is also planned to offer the course as a module within the MSc in Natural Resources and to deliver shorter versions of the course to meet demand for specific components that are of interest to participants ■

For further information, please contact:
Susan Seal, Course Leader, e-mail: s.seal@gre.ac.uk, or see the course flyer on our website:
www.nri.org/study/shortcourses

For general information about the MSc in Natural Resources, please contact:
Peter Burt, Programme Director, e-mail: p.j.a.burt@gre.ac.uk

'Partnerships in renewable natural resources research'

by George Rothschild, Emeritus Professor

Over the past decade in particular, "partnership" has become the key word in international development, and its absence from project proposals usually means no funding from granting sources. How new is the concept? In terms of overseas development, and more specifically, research on renewable natural resources supported by the UK, working relationships between publicly-funded researchers, extensionists and producers have existed for over a century, as have those supported largely through commercial sources from, for example, estate/plantation crops. The management of pests and diseases presented a number of examples of such approaches. The word "partnership" was however never used in this context. The nearest thing to partnership, as we now understand it, was usually collaboration between scientists from the "north", and this included many working in the early precursors of NRI.

There were some early examples of effective linkages between researchers, extension agents and farmers - especially where researchers were resident for long periods in developing countries. However, very often there were no distinct extension services, and NGOs were virtually non-existent at this time. Researchers were often also responsible for extension. With independence and the creation of national programmes in many developing countries from the early 1960s onwards, these working relationships highlighted greater involvement of local counterparts. However, the agendas still tended to be "northern" researcher-driven - albeit often based on long first-hand experience of local problems. So what's new? A number of things have contributed to the rise of the partnership/ participatory principle over the past two decades, and most especially during the 90s: Firstly, science and technology have advanced

rapidly over this period and increased specialisation has become mandatory. Virtually all types of problems call for collaboration between specialists, with a greater number of these coming from the "south" (often after having received higher degree training in the course of projects). This is well illustrated in each of the five PAHHG projects described in this Newsletter. Additionally, the past decade has seen significantly greater emphasis of the CGIAR centres on partnership through networking and consortia, and this is also reflected in two of the PAHHG projects.

Secondly, and as significantly, there has been far greater involvement of social scientists in what was previously a largely technical domain. This has helped identify social and other constraints to the adoption of new technologies. Many of these constraints stemmed from the lack of involvement of the intended beneficiaries and other key stakeholders in the identification of real needs and in the process of researching, developing and delivering new technologies; hence, the rapid growth of, for example, farmer participatory research and related partnership activities. The PAHHG projects described in this Newsletter are all examples of demand-led research.

The continued underinvestment by many developing countries in RNR research, especially in Africa, remains a major issue, but the problem is far worse for government extension services. The emergence of technology-oriented NGOs as well as the local private sector over the past two decades has helped in part at least to counter this problem. These organisations, as well as civil society bodies, have become key partners in international research for development. An example of such linkages is the Trypanosomiasis/malaria project in this Newsletter.



As illustrated above, there is clearly an overwhelming and indisputable case for partnerships in terms of enhanced outcomes for those targeted, achieved through synergies, the ability to build capacity and many other positive factors. However, as most know, there are also downsides that, because partnerships carry costs, often become most noticeable when resources are limited and when there are a significant number of partners.

Four of the five projects in the Newsletter are supported by DFID through its outsourced RNRRS programmes which are due to end in March 2006. Achievements from most RNRRS projects have been significant not only in terms of addressing demand-led problems of the poor, but also in fostering partnerships through collaborative research, and strong involvement in capacity building, dissemination and uptake; achieved despite the lack of resources to undertake the last three.

Piloting and scaling-up of the outcomes of research outcomes has been arguably the greatest constraint in achieving the level of impact hoped for in many cases. The challenge for DFID in developing a meaningful new research strategy will be to establish effective 'internal partnerships', thereby ensuring that research is properly integrated into the mainstream development agenda, especially that of the country programmes. As importantly, adequate resources need to be available over the long-term to ensure the maintenance of a strong UK science base devoted to undertaking partnership-based research that targets the needs of the developing world ■

Streaky bananas

NRI has worked closely with the National Agricultural Research Organisation (NARO) in Uganda for many years. The partnership has resulted in useful research outputs which have had significant impact on farmer livelihoods in a range of crop and livestock systems. One of several active areas of recent research collaboration has been with NARO's Banana Programme, led by Dr Wilberforce Tushmireirwe who is based at the Kawanda research station just north of Kampala. Dr 'Tush' was instrumental in identifying and mapping the spread of banana streak virus disease (BSV) which was first observed in Uganda in the early 1990's. This is a complex disease that can result in high yield loss and there are few practical methods available to control it.

The Crop Protection Programme of the United Kingdom's Department for International Development (DFID) recognised the need to support some basic research to help understand how BSV is expressed in banana plants and how the disease is spread. A team at the John Innes Institute in Norwich worked with Dr Tush and colleagues to examine the variability of the virus and to develop a sensitive diagnostic test. In a parallel project, NARO staff collaborated with NRI, the University of Reading and the International Institute of Tropical

Agriculture to study the dynamics of BSV spread and to investigate how different factors affect the intensity of disease expression. The ultimate objective was to develop improved BSV management options which would help farmers to obtain more income from their banana plots.

The research on disease spread was carried out by Jerome Kubiriba, with support from Lawrence Kenyon, Tim Chancellor and Richard Lamboll at NRI, while the work on the effect of the disease on banana growth and yield was carried out by Charles Murekezi, supervised by Tim Wheeler and Simon Gowen at the University of Reading. Jerome's work formed part of a PhD programme with the University of Greenwich. The research has progressed very well and he submitted his thesis in May 2005. Jerome has shown that at least three mealybug species present in Ugandan banana fields are capable of transmitting BSV, and that spread into, and within fields, is slow. This is consistent with what is known about other similar mealybug-borne viruses and has helped to clarify the most suitable control options. Resistant varieties are not currently available so the emphasis is on ensuring that planting material is virus-free and that infected plants are removed from the field before they can act as a source for further spread.



Above: Mealybug vectors of BSV are often found under the leaf sheaths of banana plants.



Above: Jerome Kubiriba (red shirt) and team prepare to assess BSV incidence on banana trial plots in Mbarara, south-western Uganda.

The BSV research is part of a wider integrated crop management strategy being developed by NARO with financial support from the DFID Crop Protection programme. This allows a range of biotic and abiotic constraints to be addressed using a holistic approach and making best use of available expertise from a range of research organisations. Mike Rutherford of CABI-Bioscience is currently leading a project to improve the promotion and adoption of some of the technologies and strategies developed through the collaborative research over the last few years. Jerome will have an important role to play in helping to build on this research. On his return to Uganda he will take up the position of senior plant pathologist in NARO's banana programme. One of his immediate priorities will be to identify appropriate control strategies for bacterial wilt of banana (caused by *Xanthomonas campestris* pv. *musacearum*) which has spread rapidly throughout the central region of the country and is posing a serious threat to banana production. Jerome will also continue to help develop and promote cost-effective, sustainable strategies for reducing the spread and impact of BSV.

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From chickpeas to houses

Collaboration between the International Crops Research Institute for the Semi-Arid Tropics (ICRISAT) and NRI in association with the Nepal Agricultural Research Council has successfully promoted adoption of an integrated crop management (ICM) strategy for chickpea (*Cicer arietinum*) to more than 3,500 farmers across Nepal. This initiative has doubled yields and dramatically improves reliability of this important and versatile winter crop. Particularly suited to dry winters, chickpeas have deep roots and can flourish even on residual moisture in paddy fields after rice has been harvested. With 400,000 ha of paddy left fallow during the winter in Nepal the opportunities for increasing production are huge. The two principal problems for farmers in Nepal are *Botrytis* Grey

Mould causing flower drop, and thus no seed, and the pod borer insect (*Helicoverpa armigera*) which feeds on the immature seed pods.

Our ICM strategy comprises high-yielding and disease resistant varieties developed by ICRISAT along with very low input insecticide applications using one or two sprays of the insecticide Thiodan. NRI has also developed a formulation for successful application of the biopesticide nucleopolyhedro virus and shown that this is as effective as chemical pesticides for controlling the insect. The outcome has been impressive. The increased yields for farmers who pursued the technologies independently during the following season were on average worth about US\$200 per farmer. Livelihood studies showed that this increased wealth was invested in all aspects of domestic life, notably in housing with many moving from mud to brick houses and some building new houses from scratch.

About 22% of farmers reported paying off debts, with other increases in spending on education, clothes and healthcare. Overall domestic expenditure increased by about 45%. The current phase of the project is developing a policy document with the Nepal Ministry of Agriculture to determine a strategy for country-wide adoption of the ICM package.

Farmers have almost entirely replaced tomatoes with chickpea as the main source of winter income in Lalbandi. One of the project farmers, Mrs. K Shrestha (below), was awarded a district agricultural prize for yielding chickpea at more than 4000kg Ha⁻¹.

For further information, please contact: Phil Stevenson
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Fish trematodes

Fish-borne trematodes are a particular problem in some countries due to the consumption of raw, undercooked or fermented freshwater fish products. Approximately 40 million people are estimated to be infected with fish-borne trematodes in Southeast Asia and China. Trematode (flake) infections in humans are difficult to detect and the symptoms of infection are often quite general and may be mistaken for a range of other infections and conditions. Infection results in morbidity and predisposes hosts to bile duct cancer. Lack of sufficiently sensitive and rapid diagnostic tools currently presents an obstacle to determining who is infected and identifying suitable treatment and epidemiological control measures.

The 'TREMKIT' project, which is led by NRI, was initiated in 2002 to develop diagnostic tools for three target trematode species. The project is funded by the International Cooperation for Development component of the 5th Framework Programme of the European Union, with additional support by FAO which hosts the TREMKIT Virtual Office at www.onefish.org. PCR-based tests are being developed collaboratively by partners in India (Prof. Karunasagar, Mangalore College of Fisheries), Thailand (Prof. Sithithaworn, Khon Kaen University), and Germany (Dr J. Schmidt, University of Düsseldorf) and antibodies are being developed by partners in China (Prof. Zheng, Institute for Parasitic Diseases, Shanghai) and Thailand (Prof. Sithithaworn, Khon Kaen University). Diagnostic tools, kits and procedures will be validated and compared in the UK (NRI), prior to funding being sought for commercialisation of the kits.

The antibodies developed are intended to be used as a mass-screening tool to replace the current time-consuming microscopy methods carried out on human

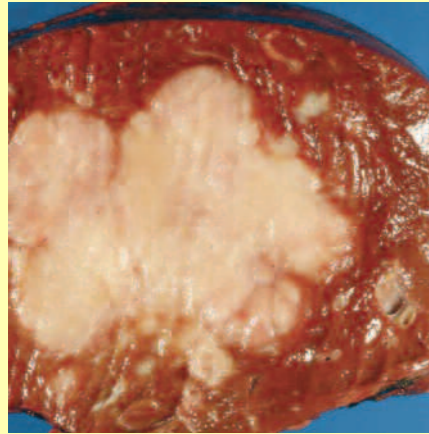


Above: Mixture of cyprinoid fish, which act as host for the trematode fluke *Opisthorchis viverrini*. (Photo courtesy of Prof. Paiboon Sithithaworn, Khon Kaen University, Thailand).

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faeces by health authorities. The antibody-based method(s) do not need to differentiate between the three trematode species in the study area



Chronic *Opisthorchis viverrini* infection is associated with cholangiocarcinoma of the bile duct system, which can extend into the liver as shown here.

(Photo courtesy of Prof. Paiboon Sithithaworn and The Liver Fluke and Cholangiocarcinoma Research Center, Khon Kaen University, Thailand).

(*Opisthorchis viverrini*, *O. felineus* and *Clonorchis sinensis*), as all target species respond to the same antihelminthic drugs.

In contrast, species identification is essential for epidemiological studies. TREMKIT has developed tests based on polymerase chain reaction (PCR) technology to detect trematode DNA. PCR tests are very sensitive and highly specific but relatively expensive, so their use will probably be restricted to research tools for universities and international agencies. It is hoped that a combination of the two tools will greatly improve our knowledge of the trematodes, those at risk and identify methods for reducing levels of infection.

For further information, please contact:

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or,

Ian Watson

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Tomato leaf curl

The project on the whitefly, *Bemisia tabaci*, and tomato leaf curl virus (ToLCV) disease really began when Professor Muniyappa and I met at a conference in Israel in 1995, where we first discussed our respective work on whiteflies and the geminiviruses they transmit. One of the things that immediately struck me about Prof. Muniyappa, was his deep interest and enthusiasm for this subject. He is a plant pathologist, yet he clearly had an interdisciplinary approach to problem solving. He had maintained a successful whitefly colony for his transmission experiments for many years at the University of Agricultural Sciences in Bangalore (UASB) and had already used them to screen a large quantity of tomato germplasm, in order to assess their resistance to the South Indian ToLCV.

Shortly after this, an opportunity arose to apply for funding through the DFID Crop Protection Programme, to work in India on whiteflies and geminiviruses. I therefore wrote to several people in

India asking them if they were interested. About a month later, a letter arrived from Prof. Muniyappa to say that he would certainly like to be involved and that he thought we should concentrate on ToLCV.

The first hurdle to getting the project off the ground, however, was to get our proposal approved by the UASB project assessment office. At the meeting in Bangalore, where the project documentation was discussed, the legal terms in the contract caused a lot of consternation and a decision on its approval was left "pending". This is when I first realised what an effective counterpart Professor Muniyappa would be. Rather than accept defeat, Professor Muniyappa promptly arranged a meeting for us with the Vice-Chancellor of the University, Dr Veeresh.

This meeting turned out to be very different and Dr Veeresh listened carefully to what we had to say. After that, he offered us a cup of tea and asked about other people at NRI and how they were doing. I was amazed by his knowledge of NRI and he later



Tomatoes of the high yielding ToLCV-resistant variety TLB 130.

“Now, how about all these other problems! What are you going to do about those?”

Dr Krishnappa, Vice-Chancellor, University of Agricultural Sciences in Bangalore, India

explained that he had worked on termites for a while and had met Tom Wood, a former colleague, and the NRI termite group on a previous visit to the UK. We chatted a bit more and then, as we were preparing to leave, he waved his hand towards the project documentation and said that he hoped we would make rapid progress towards solving this "burning problem". Since then, there have been many occasions when the project could have been derailed but, each time, Prof. Muniyappa and the staff at the UASB were extremely supportive and resourceful, ensuring that the work continued. When the non-indigenous 'B' biotype of *B. tabaci* first arrived in India, for instance, and caused the collapse of tomato production in Kolar district, which supplied Bangalore with tomatoes, we were extremely worried that our ToLCV-resistant varieties we were testing there would also collapse under the intense disease pressure. When this didn't happen, the relief of the farmers, project and UASB staff was clear. In fact, after this severe test, the value of the technology that we were developing became apparent to

everyone, including the representatives and breeders of commercial seed companies, who attended the farmer-field days.

Throughout the life-time of the project, the UASB has set new precedents with regard to the project. For example, the UASB Vice-Chancellor in the last couple of years, Dr Krishnappa, has been particularly keen to ensure that, "the roots of the research are not only fed by the UASB, while the fruits are harvested only by the private sector". As a result of his forward thinking, the three ToLCV-resistant varieties, Nandi, Sankranthi and Vybhav, were sold to ten commercial seed companies under a non-exclusive licence to use them in the development of resistant hybrids and to market them. In addition, within the UASB, Prof. Ramaiah of the National Seed project, has now set up a 'revolving fund', where receipts from the sale of seeds are used to produce more seed for sale, to ensure the sustainability of seed production after project funding ends. This activity will also ensure that seed of the varieties will be available for the poorest of the tomato growers at a minimal cost. The project is now entering a promotional and dissemination phase. Telecommunications have moved on a lot since the start of the project, when Bangalore only had a single internet café. In keeping with the forward thinking characteristic of the UASB, the project now has a web site being built, which will shortly be located within the UASB's web site under 'Breakthrough Research'. The project's web site can currently be viewed at:

www.mensacomp.com/tomato

In my last meeting with Dr Krishnappa, he acknowledged the project's progress towards solving the ToLCV disease problem, but said, "now, how about all these other problems! What are you going to do about those?"

Dr Muniyappa, who is now retired and acts as a consultant on the project, and I looked at one another and laughed. The answer to that, as they say, will hopefully be another story.

For further information, please contact:

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NRI, farm and flies

NRI's work on the vector-borne diseases of humans and livestock has had a long association with the UK charity, FARM Africa. The partnership started in 1994, when FARM asked NRI for advice on how to control animal trypanosomiasis in the Konso district of southern Ethiopia. The disease is transmitted by tsetse flies and is the major cause of cattle mortality and morbidity in southern Ethiopia. NRI's David Hall visited Konso and following his advice, FARM embarked on a community-based scheme to control tsetse using insecticide-treated cattle. Within a year, the numbers of tsetse were reduced by ~90% and the health and productivity of cattle in the area increased dramatically.

A young veterinarian, Tibebu Habtewold, was largely responsible for the day-to-day running of the operation. Intriguingly, local people told him that not only were their cattle healthier but they also noticed that the incidence of malaria was reduced. There were no quantitative data to support the anecdotal evidence, but Tibebu became interested in assessing whether such an effect was possible. In Ethiopia, the main vector of malaria (*Anopheles arabiensis*) feeds on cattle and humans and hence it was theoretically possible that insecticide-treated cattle could reduce malaria transmission. This intriguing possibility eventually led to Tibebu becoming a PhD student with NRI where he undertook



FARM's Inaki Tirados (holding trap) installing light traps to catch mosquitoes in a village in the Konso District of Southern Ethiopia.

“A partnership between a field-based agency such as FARM-Africa and a leading research institution such as NRI can be very powerful. Together we make an original contribution to knowledge that can be translated into real benefits to poor farmers and livestock keepers”

Dr Christie Peacock, Chief Executive, FARM-Africa

research in southern Ethiopia, under the supervision of Gay Gibson and Steve Torr, to quantify the role of cattle in the transmission of malaria in southern Ethiopia. Tibebu gained his PhD earlier this year and the first paper from his PhD was recently published in *Medical and Veterinary Entomology* (Habtewold *et al.*, 2005).

The work carried out by Tibebu and others indicated that treating cattle with insecticides would kill malarial mosquitoes. But would this control malaria? The answer to his question is currently being addressed by a third joint NRI-FARM project. The project, currently in its third year, returned to the villages in Konso where the anecdotal effect on mosquitoes was first reported. Various aspects of malaria transmission are being quantified to allow us to predict the likely impact of insecticidal cattle on the incidence of malaria. The principal scientists on this project are Steve Torr and Gay Gibson from NRI and Inaki Tirados, a vector ecologist with FARM who divides his time between field work in Konso and laboratory work at NRI. The research is still in progress, but the results to date suggest that, for Konso at least, insecticide-treated cattle could indeed reduce the incidence of malaria significantly. NRI and FARM are currently developing a proposal to undertake a large-scale trial to test this prediction.

FARM-Africa's Chief Executive, Dr Christie Peacock, notes that "A partnership between a field-based