



Supporting International Agricultural Research for a Food Secure World



THE CRAWFORD FUND

For a Food Secure World

Annual Report
2010–11



SIR JOHN CRAWFORD

The Fund was named to honour the life of Sir John Crawford, a remarkable Australian who fervently supported international agricultural research for rural development and contributed greatly to the establishment of the CGIAR and its associated research centres. He was also, along with Mr James Ingram and the Hon Malcolm Fraser, one of the principal architects of ACIAR.

Born in Sydney in 1910, Sir John began his role in the public service during the Second World War and became Director of Research at the Department of Post-War Reconstruction in 1943. After the war he was appointed as Director of the Bureau of Agricultural Economics, and then Secretary of the Department of Commerce and Agriculture. Later, as Secretary of the Department of Trade, he played a prominent role in reshaping Australia's trade relationships with the United Kingdom and Japan. With counterparts in Japan and the United States, he helped construct an Asia-Pacific economic and policy community.

In 1960 Sir John joined the Australian National University as the inaugural Director of the Research School of Pacific Studies and subsequently served as Vice-Chancellor and Chancellor. He was instrumental in setting up the Australian Government's international aid agency in the 1970s. In being awarded the title of Australian of the Year in 1981, then Governor General Sir Zelman Cowen described Sir John as 'one of the foremost architects of Australia's post-war growth.'

Sir John's international contribution from the 1960s through to his death in 1984 was equally remarkable: as an adviser to governments in India, Indonesia, Papua New Guinea and elsewhere, and to the World Bank; and as chair of the CGIAR's technical advisory committee. His wisdom is sorely missed.

What is the Crawford Fund?

Established in 1987, the Crawford Fund is a non-profit, nongovernmental organisation (NGO) dedicated to raising awareness of the benefits to developing countries and to Australia of international agricultural research. The Fund encourages investment by governments and the private sector in such research and its applications.

Why is there a need for our work? In short, the majority of people in less developed countries live in rural areas and depend on the land for their employment and food security. As such, support for agricultural research is one of the most effective ways for Australia to help the environment, economies and people — food producers and consumers alike — of developing countries.

We aim to sustain international agricultural research for the decades to come by promoting and supporting research and development activities in which Australian organisations and companies are active participants. We also support the Australian Centre for International Agricultural Research (ACIAR) and the Australian Agency for International Development (AusAID), as well as the centres of the Consultative Group on International Agricultural Research (CGIAR) and other international research centres. The Fund depends on grants and donations from governments, private companies, corporations, charitable trusts and individuals.

The Fund carries out its work through a range of activities. Our public awareness program, which includes journalist visits, media stories and innovative events, increases understanding of the importance and potential of international agricultural research. Our training program offers practical, highly focused instruction to men and women engaged in agricultural research and management in developing countries.

Those involved with the Crawford Fund share our vision of a better world realised through the dedicated efforts of agricultural scientists leading research, development and training in developing countries. Through their work, we can achieve more productive and sustainable agriculture, less poverty and hunger, and a more secure world.

From the Chair and the Executive Director

CONTENTS

- 2 Overview
- 5 Public Awareness Program
 - Public Events
 - International Visitors
 - Journalist Visits
 - Media Highlights
- 12 Master Classes and Training Program
 - Master Classes
 - Training
 - Crawford Fund Trainees
- 24 International Agricultural Research
- 26 Directors' Report
 - Audited Statements
- 30 Board, Committee Members and staff

A note on the period covered in this report: *this is the first Crawford Fund Annual Report published since our transition to an independent not-for-profit company. Information on Fund activities spans the 18 months from 1 January 2010 to 30 June 2011. Reporting on financial matters covers the 2010–11 financial year only.*

The past 18 months have been remarkable for the Crawford Fund. For a start, on 1 July 2010 we became an independent not-for-profit company. The Board managed the Fund's transition from being a division of the Academy of Technological Sciences and Engineering (ATSE) to an independent enterprise closely linked to the Academy, its sole member, ensuring that the two organisations continue to benefit from their historic links. This change, which gives the Fund a measure of operational flexibility, also carries with it added fiduciary responsibilities for the Board.

This period also brought substantially increased funding from the Australian and Queensland Governments and continued support from all other States and Territories. The Board established a Tasmanian Committee and welcomed its inaugural Chair, Mr Ian McKinnon. We now have Board Committees and Programs in every State and Territory in Australia, and every jurisdiction has a place on the Board. Underlining its federal character, the Fund's first State Parliamentary Conference – in Brisbane in April 2011 – complemented the annual event in Canberra.

As well as these and many other firsts, the Fund's increased funding allowed an expansion of its public awareness, training and Master Class programs, the importance of which were confirmed as growth in global demand for food outstripped growth in supply. During the year, this underlying trend was exacerbated by a series of short-term factors – last seen during 2008's food crisis – leading to a sharp spike in world food prices in the last quarter of 2010 and early 2011. Efforts by the international community to reform the CGIAR also continued, and were made all the more urgent by declining agricultural productivity.

The 2010–11 period was one of enormous change at the Fund. In response, we have changed the way we do business so as to capitalise on the exciting opportunities presented by our new environment. As an element of the Fund's own reform process, the Board had previously commissioned an independent review of its work by Professor Ron Duncan, which reported in late 2009. In commending the Fund's work, the review described it in the following terms:

In our view the Crawford Fund is doing excellent work in a critical area. International agricultural research to assist in ensuring food security and promoting development in poor countries is essential. The Fund's twin roles of fostering public awareness [and] providing training are critical contributions to this effort. We hope our recommendations will contribute to the Fund making an even greater contribution.

Noting with some satisfaction that the Fund has already begun to respond to this challenge, we have pleasure in submitting the first annual report of the Crawford Fund Limited.



John Kerin, Chairman



Denis Blight, Executive Director



**THE HON JOHN KERIN AM
FTSE, CHAIRMAN OF THE
CRAWFORD FUND**



**DR DENIS BLIGHT AO
FRSA, EXECUTIVE
DIRECTOR OF THE
CRAWFORD FUND**

Overview

The Crawford Fund continued what has been described as its 'excellent work',¹ in the year under review. Examples of the Fund's achievements include:

- Our first year as an independent not-for-profit company, managing the delicate transition from being a division of ATSE to an independent enterprise, while ensuring that we remain closely linked to the Academy, its sole member or owner.
- Substantially increased funding from the Australian and Queensland Governments, continued support from all other States and Territories, and a modest increase in event sponsorship and private donations.
- The establishment of a Tasmanian committee, including the appointment of two voluntary coordinators, who have already begun the process of building a state program.
- The first State Parliamentary Conference – in Brisbane – attracting more than 200 participants including key state stakeholders and a number of mayors from regional and far north Queensland; and
- Many other firsts made possible by increased funding, which allowed an expansion of our public awareness, training and Master Class programs.

So, there is plenty to talk about and even more to be done!

AGRICULTURAL RESEARCH ON A WIDER CANVAS

Crawford Fund public awareness programs must be based on robust examples of the benefits to developing countries and Australia of increased investment in international agricultural research. Much of this can be achieved by drawing on the work of ACIAR, AusAID, and national and international agricultural research centres. But the 2009 review suggested that our public awareness purpose could also be served by studies undertaken or commissioned by the Fund, which demonstrate the mutual benefits of such investment.

The Crawford Fund's efforts in public awareness and training during the past 18 months, both explained in detail in this report, were made at a time of increasing pressure on global food security. Crucially, an underlying growth in demand for food, coupled with a decelerating increase in food supply, was exacerbated in the early months of 2011 by a convergence of short-term factors, last seen during 2008's food crisis. This situation, fed by higher energy prices, diversion of food grains to bio-fuels, and catastrophic weather events in some food-producing regions, led to another sharp spike in world food prices in the last quarter of the financial year.

The impact of the spike, which was accompanied by inadequate and sometimes plain wrong national policy responses, contributed to serious civil unrest – especially in North Africa, where price increases were especially evident.

Impact

Donors and governments will continue to support the Fund if they are satisfied by its impact in raising awareness of global food security issues and by the outcomes of its training efforts. For this reason, the Fund has given particular attention to appraisal, impact assessment and monitoring of its work.

The Fund contributes to global food security and sound policy development in two key ways: by ensuring public awareness of the benefits of international agricultural research; and through activities that strengthen research and development capacities in developing countries and Australia.

Our trainees make us well aware of the impact of their training (see *\$20 million benefit from just one Master Class* on page 14) but we have also moved to more formally appraise the outcomes. In particular, in cooperation with ACIAR and the Centre for International Economics, we have developed and used a robust methodology² to measure the impact of training and institution-strengthening activities. The methodology shows that training can have marked impacts on the individual trainees, the institutions to which they return, and rural development in their countries more broadly. For example, some simple observations made in the course of a Master Class on soil-borne pathogens conducted in China revealed for the first time the presence of the cereal cyst nematode in wheat fields in Henan and three adjacent provinces (Anhui, Hebei and Shandong). The discovery stimulated remedial measures potentially, saving the country hundreds of millions dollars in lost wheat production.

In response to the review, the Fund will also increase its efforts to assess the likely impact of project proposals put to it for funding.

The increasing gap between supply and demand and the accompanying price spike also underlined the interactions between food security, energy, climate change, biosecurity and biodiversity, public- and private-sector investment in research, and land and water resource issues more broadly. These interactions have all been addressed at Crawford Fund conferences over the past decade. Towards the end of the financial year we initiated a study, in partnership with a number of other international foundations, that examines agricultural research in the wider context, and draws on the wealth of experience, material and expertise available to the Fund. See page 24 for a background note on the study, which seeks to show how increased investment in agricultural research and development is an essential component of any response to food-price spikes, the underlying gap between demand and supply, and how these issues link to and influence non-agricultural sectors.

Also during the past 18 months, efforts continued by the international community to reform the CGIAR – a task made more urgent by declining agricultural productivity. We also ask how might the Fund contribute to the reform process given that our network includes seasoned contributors to the CGIAR and beyond.

A TIME OF CHANGE

Change was also a feature of life at the Fund, with 'business as usual' an inadequate response to our changing environment. On 1 July 2010, we began operations as a not-for-profit company with ATSE as the sole member of the company. This change moved the Fund from being a division of the Academy to a separate enterprise, giving us an independent status and more operational flexibility. It also carried with it significant transitional tasks and responsibilities including the need to maintain an effective working relationship with ATSE in a way that ensured the two organisations continued to benefit from the links forged over the previous 25 years.

Examples of such efforts included oversight of the Fund's accounts by the ATSE's Audit and Investment Review Committee, on which we are represented by Board member Dr Tony Gregson and the Executive Director; regular contributions to ATSE's newsletter; participation on the Board of the Fund by two ATSE nominees; and high-profile participation by ATSE President Professor Robin Batterham in the our inaugural State Parliamentary Conference.

Volunteers and training

The Fund depends for its success on the participation of a wide network of volunteers supported by a very small administrative team. It has been able to keep its overhead costs to a minimum by employing only part-time staff (the Executive Director, for example) and coordinators who are paid a notional honorarium. It also increasingly makes effective use of modern information and communications technology and processes.

Training is delivered through State and Territory Programs

The Fund operates through State and Territory Committees, each with a coordinator, a chair, and membership drawn from local business, government and development communities. Coordinators receive a notional honorarium; all other members are unpaid. The committees and their largely informal networks organise the bulk of the Fund's specialised training activities and are often involved in Master Class programs. The committees, now constituted as Committees of the Board (as resolved by the Board during the year), are an essential feature of our operations. See pages 30-32 for a full list of State and Territory Committee members.

This approach, which differentiates us from many other development assistance NGOs, ensures a very close relationship between the Fund and grass roots research and training organisations throughout Australia. Novel examples of the Fund drawing on otherwise underused resources or non-institutionalised capabilities include its 'Women in Agriculture' training in Papua New Guinea. This is led by Ms Cathy McGowan, an Australian consultant from Yackandandah, Victoria.

IMPLEMENTING RECOMMENDATIONS OF THE INDEPENDENT REVIEW OF THE FUND

As an element of its own reform process, the Fund commissioned an independent review of its work by Professor Ron Duncan, who reported late in 2009. The review commended the Fund's work, emphasising our critical contributions to international agricultural research through fostering public awareness and providing training.

More detail on the review and the Fund's response over the last twelve months is evident from measures described elsewhere in this Report – see especially *A time of change* and *Impact* on the previous pages, and *Agricultural research on a wider canvas* on page 24. The Fund has also significantly upgraded its financial reporting and administrative systems.

INCREASED FUNDING FOR INTERNATIONAL AGRICULTURAL RESEARCH

As part of its response to the world food price crisis of May 2008, the Australian Government substantially increased funding to international agricultural research in 2009–10. This increase was based in part on recommendations, published in October 2008, by the Crawford Fund task force on the food crisis.



CIAT

- 1 This phrase was used in an independent review of the Fund, undertaken late in 2009, to describe our activities.
- 2 Impact assessment of capacity building and training: assessment framework and two case studies, ACIAR and the Crawford Fund, February 2007

Increased core support for the Fund

After consideration of the review and an accompanying three-year strategic plan prepared by the Fund, the Australian Government agreed to a 33% increase in its core grant (which had been held at the same real level for the previous five years).

Increases in subsequent years are to be considered on a year-by-year basis (the grant for 2011–12 has been maintained at the same real level provided this year).

In the same year, the Government of Queensland agreed to increase its contribution by 50% and the Tasmanian Government made an initial contribution.

Only the two Territory Governments are yet to make grants, although they will be approached again in 2011–12.



CIAT

THE FUND'S INCREASED SUPPORT IS SOWING THE SEEDS FOR EVEN GREATER IMPACT IN THE FUTURE.

Public Awareness Program

Features of the Crawford Fund's expanded Public Awareness Program included our first State Parliamentary Conference, another successful annual conference, the management of a range of visits to Australia by senior representatives from the international agricultural R&D institutes, a series of 'Seeing is Believing' journalist visits to developing countries, ongoing well-covered media efforts around significant developments in agricultural research, and ongoing liaison with key stakeholders and decision makers. This section provides Program highlights from January 2010 to June 2011.

PUBLIC EVENTS

First State Parliamentary Conference

Increased grants from the Australian and Queensland Governments enabled the Fund to underwrite its first State Parliamentary Conference, held in Brisbane in April 2011 and titled ***A food secure world: challenging choices for our north***. The conference brought together world and Australian specialists to discuss food security issues that are relevant and topical to Queensland. In his personal summary of the event Michael D'Occhio, Professor of Food Security at the University of Queensland, said:

Australia does not contribute to global food security only by exporting food. Rather, Australia's past and future contribution to global food security is through education, training, knowledge and technology transfer in partnerships with developing countries.

With more than 200 registrants, the oversubscribed event reflected a strong interest among Queenslanders in how they and others are grappling with food production in the tropics and in the mutual benefits of international agricultural research.

High-profile speakers included Dr Kanayo F Nwanze, President of the International Fund for Agricultural Development (IFAD); Dr William D Dar, Director General of the International Crop Research Institute for the Semi-Arid Tropics (ICRISAT); and Professor Robin Batterham, ATSE President, Crawford Fund board member and former Chief Scientist of Australia.

As explained in Professor D'Occhio's summary, which was distributed to all registrants, the conference provided the opportunity to review the past, present and future roles of Queensland in agriculture and food production. He noted that with soils and climatic zones similar to many other countries, the future challenges for Queensland, and northern Australia generally, are essentially those shared with the rest of the world. As such, the state's global role is set to continue as the world deals with a range of issues including: climate change and climate variability; the need for improved plant and animal adaptation and production; diminishing natural resources; conflicting demands on arable land; declining productivity; increasing costs of production; achieving prosperity from agriculture; social inclusion; and complex global trade in food and its effect on food prices.

2010 National Parliamentary Conference

The Fund's 2010 Parliamentary Conference – ***Biodiversity and food security: Nourishing the planet and its people*** – was held on 30 August–1 September at Parliament House in Canberra. Keynote speakers included Professor Stephen Hopper, Director of the Royal Botanic Gardens, Kew, and Dr Cristián Samper, Director of the National Museum of Natural History at the Smithsonian Institution, Washington DC.



PROFESSOR STEPHEN HOPPER, DIRECTOR OF THE ROYAL BOTANIC GARDENS, KEW, DELIVERS THE SIR JOHN CRAWFORD MEMORIAL LECTURE AT THE 2010 PARLIAMENTARY CONFERENCE.



CHRISTIÁN SAMPER, DIRECTOR OF THE NATIONAL MUSEUM OF NATURAL HISTORY AT THE SMITHSONIAN INSTITUTION, ADDRESSES THE 2010 PARLIAMENTARY CONFERENCE.

Professor Hopper, who delivered the Sir John Crawford Memorial Lecture, addressed the global ambition of sustainable healthy living for all, which he said was challenged by accelerating change, entrenched patterns of land and water use, biodiversity loss, rising consumption, and population growth. There was, he suggested, little hope of continuing the green revolution if it remained focused on a few mainstream crops without new land and water ethics, and new economic and political systems that valued social and natural capital as much as financial assets.

Professor Samper said that biodiversity was the basis for agriculture and for a sustainable future. Despite biodiversity becoming homogenised in modern agriculture, he noted that new tools and technologies offer opportunities for using and changing the genetic diversity of crops. He declared it crucial that we bring together knowledge from biodiversity science and agricultural research to ensure these opportunities are seized. It might be noted – perhaps surprisingly – that the Parliamentary Conference was one of few held in the International Year of Biodiversity specifically to bring these two groups together.

The conference also provided a focus for a concentrated media effort to raise awareness of issues of importance to world food security, this time around biodiversity conservation. There was significant media coverage of both the international topics raised – that of the conference title itself, as well as the issue of Australia's contribution to global food security through our own native genetic resources. The topic achieved heightened awareness as the 2010 International Year of Biodiversity drew to a close, with stories on national TV and radio current affairs programs; extensive rural radio and print coverage; features in outlets as diverse as the prestigious US journal *Science*, *Cosmos* magazine and *Chemistry in Australia*; and other publications, including *Issues* magazine and ATSE's *Focus*, devoting special issues to the topic of biodiversity and food security.

Agricultural economists address international development

ACIAR and the Crawford Fund supported the national conference of the Australian Agricultural and Resource Economics Society, held on 10–12 February 2010 in Adelaide. The conference was opened by Crawford Fund chairman at that time, The Hon Neil Andrew. The event featured a range of well-known international and Australian economists addressing development issues. The Crawford Fund managed the media effort for the event, which received good coverage in national, metropolitan and rural print and radio outlets.

Wheat Warriors

A group of Australian farmers, scientists, researchers, economists and wheat breeders have been awarded the title 'Wheat Warriors' to honour their contributions to the battle against global hunger through collaboration with the world's leading international wheat research and training organisation, the Mexico-based International Maize and Wheat Improvement Center ('CIMMYT' from the Spanish name). The Wheat Warriors were honoured at a 9 April dinner in Canberra co-hosted by the Crawford Fund and ACIAR. The event was attended by the CIMMYT Board – the first board of any CGIAR centre to meet in Australia – and senior staff.

Dr Jim Syme was chosen as the 'warrior of warriors'. In the 1970s, Dr Syme received from Nobel Laureate Dr Norman Borlaug a semi-dwarf wheat variety, WW15, with which he developed varieties such as 'Oxley'. This brought CIMMYT's high-yielding genes to prime hard wheats in northern Australia. The other warriors were Paul Brennan, Kenneth Fischer, James McWilliam, Edwina Cornish, Anthony Gregson, Timothy Reeves, Ligia Ayala-Navarrete, Lloyd Evans, Tony Fischer, Peter Ninnes, John Brennan, John Dixon, Robert McIntosh, Richard Trethowan, Terence Enright and Paul Fox. The Fund's Queensland, New South Wales and Victorian committees held their own events to honour wheat warriors from their States.

The Fund helped organise the visit along with ACIAR and the Grains Research and Development Corporation. Press coverage around both the visit and the Wheat Warrior announcement yielded reports in national rural media including Rural Press, Weekly Times, Radio National's Bush Telegraph and other ABC outlets.



**WHEAT WARRIORS (LEFT TO RIGHT)
LLOYD EVANS, PETER NINNES, PAUL FOX, TERRY ENRIGHT,
JIM SYME, TIM REEVES, LIGIA AYALA-NAVARRETE AND JOHN
DIXON.**

Plant pathologists invade Australia

On 26–29 April 2011, Darwin hosted 400 plant pathologists from around the world at a joint international conference of the Asian Association of Societies for Plant Pathology and the Australasian Plant Pathology Society. Delegates came from Australasia, North America, Africa, Asia, the Middle East, and the United Kingdom. The Crawford Fund supported training for a group of 26 delegates from developing countries. We also managed the media effort for the event, which generated national coverage of major international and Australian issues, threats and developments in plant diseases and crop protection of field and horticultural crops, forests and natural ecosystems.

INTERNATIONAL VISITORS

Conservation tillage in Iraq

Dr Colin Piggin from the Syria-based International Center for Agricultural Research in the Dry Areas (ICARDA) visited Australia in early 2010. Dr Piggin is the leader of the ACIAR–AusAID project to increase the productivity, profitability and sustainability of crops in the drylands of northern Iraq. The Fund and ACIAR worked with State institutions on public addresses and meetings in the Australian Capital Territory, Western Australia and South Australia, and assisted with national media coverage. Interviews were organised for national and regional radio, rural print media and ABC TV Landline.

Tapping into farmer knowledge

Dr Trevor Nicholls, Director of CABI, visited Australia for *Global Biosecurity 2010: safeguarding agriculture and the environment*, held in Brisbane on 28 February – 3 March. CABI is a not-for-profit international organisation that improves lives by providing information and applying scientific expertise to solve problems in agriculture and the environment. The Fund organised meetings and media coverage for Dr Nicholls' visit, including a meeting with the Federal Parliamentary Secretary and national radio and print coverage.

Media coverage highlighted CABI's plans to create a comprehensive global database of plant health, underpinned by its ever-growing collection of the world's most extensive and trusted agricultural content. Of particular interest was CABI's innovative Global Plant Clinic, which offers a unique opportunity to tap into a vital source of information that traditionally has been difficult to access – the farmer.

Landcare forum

Dr Dennis Garrity, Director General of the Kenya-based World Agroforestry Centre visited Australia in March 2010 for the Landcare Forum and a series of public addresses in Canberra. The Fund facilitated national media coverage, which focused on the success of Landcare in developing countries, particularly in Africa and the Philippines.

International visitors encourage collaboration

In addition to almost 30 trainees at the plant pathologist workshops and conference in Darwin (see *Plant pathologists invade Australia* above), the Fund supported a group of the Chinese plant pathologists on a visit to South Australia for a one-day seminar on the significant impact of cereal cyst nematodes in China and related ongoing collaboration. We also facilitated a visit to Canberra for Dr Shenggen Fan, Director General of the International Food Policy Research Institute (IFPRI), headquartered in Washington, DC. Broad media coverage was encouraged for Dr Fan's message on preventing recurring food price crises, as seen in 2007–08. A mere three years after the last crisis, Dr Fan noted that 'Food prices are rising and becoming more volatile amid expanding biofuel production, rising oil prices, US dollar depreciation, export restrictions and panic purchasing'.



CONGOLESE CHILDREN WITH DISEASED PLANTS AT A CABI GLOBAL PLANT CLINIC.



COLIN PIGGIN (SECOND FROM RIGHT) WITH SYRIAN COLLABORATORS AT ICARDA

JOURNALIST VISITS

The Crawford Fund's public awareness campaign supports visits by Australian working journalists to agricultural research-for-development projects in developing countries. Over the years, destinations have included Cambodia, East Timor, Indonesia, Kenya, Laos, Mexico, Peru, Philippines, Taiwan, Tajikistan, Thailand, Solomon Islands, Syria and Vietnam. These 'Seeing is Believing' reports provide first-hand accounts of work to improve agriculture, fisheries and forestry in developing countries through agricultural research and training.

Food security in East Timor

A Crawford Fund-supported 'Seeing is Believing' visit to East Timor by the multi-award winning ABC TV Landline program in November 2009 resulted in no fewer than three feature stories in early 2010. The reports – which included interviews with local farmers and researchers, East Timor President José Ramos Horta and the Australian Ambassador – focused on the ACIAR–AusAID Seeds of Life project and its success in developing new and improved varieties of crops to boost food security with tremendous assistance from the Seeds of Life team in Dili. In addition to the Landline reports, ABC Queensland's Nicky Redl reported across a range of ABC radio programs on her experiences in East Timor, which included viewing new Seeds of Life crop varieties in the field.

Awards for radio documentary

Sarina Locke from ABC Rural won an international and three national awards for one of the many reports from her 2009 Seeing is Believing visit to West Timor, Java and Bali in Indonesia. The story, a short radio documentary on her mother's work for AusAID in West Timor, won the International Federation of Agricultural Journalists Star Prize for Agricultural Broadcasting, as well as the NSW rural broadcasting, national radio and overall broadcasting categories at the Australian Council of Agricultural Journalists' awards in April 2010.

Improving Island nutrition

In July 2010, award-winning ABC journalist Joanna McCarthy reported for ABC TV Landline from her 2009 Crawford Fund visit to the Solomon Islands. Ms McCarthy featured the work of Dr Graham Lyons, a research fellow at Adelaide University working on an ACIAR-backed project aiming to improve food security, particularly related to the positive impact of the sweet potato.

Important work in dry areas

With the support of the Fund, the Council for Australian–Arab Relations and ICARDA, Fiona MacDonald from *Cosmos* Magazine, and Kendall Jackson from ABC Rural travelled separately to Syria to cover a broad range of stories on work by ICARDA that involves Australian support or researchers (including ACIAR projects), or is of particular interest in Australia. Ms MacDonald's first of three national print and online features was also featured on the Earth Hour blog. Ms Jackson reported on ABC Radio National and Radio Australia and posted stories on YouTube.

Agricultural research at work in India

The Fund facilitated visits to India – home to one-third of the world's undernourished children despite its fast-growing economy – by the ABC's Annabelle Homer and Deanna Lush from Rural Press. The journalists interviewed a wide range of experts on issues of food security, nutrition and development during the February 2011 trip, which resulted in extensive national radio, print and online coverage.

Their program included an IFPRI conference on agriculture and nutrition, and visits to a range of ACIAR projects and international centres including ICRISAT.



ABC RURAL JOURNALIST SARINA LOCKE WON SEVERAL AWARDS FOR A RADIO DOCUMENTARY SHE PRODUCED ON HER SEEING IS BELIEVING VISIT TO INDONESIA.



RURAL PRESS JOURNALIST DEANNA LUSH WITH DR CLL GOWDA, HEAD OF ICRISAT'S GENE BANK.

More 'Seeing is Believing'

A visit to Vietnam by ABC TV Landline journalist Kerry Straight and cameraman Chris Lockyer in mid-2010 resulted in stories, aired from August to October 2010, on ACIAR work on Vietnam's oyster industry, the WorldFish Center's efforts with the sea cucumber industry, and very successful long-term efforts to combat fruit flies. Students also learnt about these issues with the sea cucumber story airing on the ABC children's program Behind The News, which is shown in many schools around Australia as well as on ABC 3 and online. They were also replayed on a special Boxing Day edition of Landline that included repeats of a range of Seeing is Believing stories.

ABC TV Catalyst reported on 10 March 2011 about their Fund-supported visit to Kenya, with the first of three stories focusing on zoonoses – infectious diseases transmitted from humans to animals or animals to humans. The report highlighted the important work on the health of people and livestock being performed by the International Livestock Research Institute and the Biosciences eastern and central Africa Hub. The story is also available on the Catalyst website.

MEDIA HIGHLIGHTS

Threat to global wheat production

To coincide with the visit by the CIMMYT Board and senior staff of (see *Wheat warriors* on page 6), the Fund highlighted to media significant research by CIMMYT that is of interest to or in partnership with Australia. National interviews on radio and in print explained the significant threat of Ug99, a race of stem rust, to global and Australian wheat production, as well as ongoing efforts to develop drought-tolerant wheat.

Assisting Indonesia

To coincide with the March 2010 visit to Australia by Indonesian President Susilo Bambang Yudhoyono, an interview on ABC Radio National's Bush Telegraph program was organised for Dr Peter Horne, ACIAR Principal Regional Coordinator, Indonesia, East Timor and the Philippines, to discuss the special longstanding relationship Australia has with Indonesia in agricultural development.

World food security on national TV

The Crawford Fund facilitated the involvement of its Executive Director Dr Denis Blight and ACIAR Chief Executive Officer (CEO) Dr Nick Austin in a discussion on '*Food security and the global food crisis*' televised through A-Pac, a public affairs television channel funded by Foxtel as part of a development-focused series organised by the World Bank's Pacific Islands program. Also featuring ActionAid CEO Mr Archie Law, the discussion was moderated by two-time Walkley Award winner Ms Olivia Rousset. In addition to the broadcast on Foxtel, the lively debate is available on YouTube (www.youtube.com/watch?v=hOZk9chhBkk) and featured on the World Bank's Pacific Islands Praxis Discussion Series (www.worldbank.org/praxis).

R&D for a food secure future

Dr Blight discussed the important role of international agricultural research in a half hour program titled '*A food-secure future*' on Radio National's Future Tense program on 25 and 26 November 2010. He was joined by David Crombie, former President of the National Farmers' Federation and others considering the heightened concern around issues of global food security, and the role Australia should play in helping the region plan for a food secure future.

The program opened with Dr Blight setting the scene for the task ahead, saying, 'There are a billion people hungry now and unless we do something there will be more over the next 50 years. So if you want a timescale we have 50 years to double food production and make sure people have enough to eat.' The program went on to talk about the Fund's Taskforce findings and issues of food wastage, biofuels, trade, drought, and food prices and availability, all of which point to the need for more R&D.



HANS-JOACHIM BRAUN, DIRECTOR OF CIMMYT'S GLOBAL WHEAT PROGRAM, WAS INTERVIEWED NATIONALLY ON DROUGHT-TOLERANT WHEAT AND Ug99 DURING THE VISIT TO AUSTRALIA BY CIMMYT'S BOARD AND SENIOR STAFF.

Pakistan floods

The Crawford Fund helped publicise ACIAR work in Pakistan in response to interest generated by the country's disastrous floods in July–August 2010. An ABC web feature reported that the impact of the floods on agriculture was devastating, with more than half a million hectares of cropland destroyed in the highly fertile and productive state of Punjab. Interviews with Mr Les Baxter, ACIAR Research Program Manager for Horticulture, and Dr Peter Horne, ACIAR Research Program Manager for Livestock Production Systems, highlighted relevant projects in the area. Professor Kadambot Siddique from the University of Western Australia explained the significant impact on the supply of basmati rice, Pakistan's largest agricultural export and provider of foreign currency.

Agriculture, climate change and Cancún deliberations

In the lead up to the December 2010 United Nations Climate Change Conference in Cancún, Mexico, the Fund facilitated national media outreach to raise awareness of the efforts by international agricultural research centres to combat climate change. Efforts by the Global Crop Diversity Trust and its Pacific partners in conserving indigenous fruit and vegetables in the Pacific were highlighted in national radio and print interviews. Reports on Radio National Breakfast and other radio and print outlets noted that crops in the Pacific are under threat, including the root crops and starchy vegetables that once formed a big part of the diet of the Pacific people living across 22 nations.

The Coming Famine

The Crawford Fund facilitated the launch of an important new book by Dr Julian Cribb at its 2010 national conference. *The Coming Famine* is 'a strong and positive call to action, exploring the greatest issue of our age and providing practical suggestions for addressing each of the major challenges it raises'. Fund Board Chair The Hon John Kerin launched the book at the conference reception. It has received very positive reviews in publications worldwide including the *New York Times* and Toronto's *Globe and Mail*. It's available through the Commonwealth Scientific and Industrial Research Organisation (CSIRO) at www.publish.csiro.au/pid/6447.htm.

Crop supply and demand

The Australian Agricultural and Resource Economics Society 2011 Conference in Melbourne on 8–11 February provided an opportunity for national print and radio coverage on food security issues. Participants including Professor Tom Hertel, Director of Purdue University's Centre for Global Trade Analysis, and Professor Phil Pardey, Director of the University of Minnesota's International Science and Technology Practice and Policy Center, were interviewed on issues such as availability of crops and cropland, expected crop yields, and the need for research to boost agricultural productivity.

Australian seed to arctic vault

Crawford Fund board member Dr Tony Gregson visited the Svalbard Global Seed Vault, built into permafrost on the Norwegian island of Spitsbergen, in February 2011. Dr Gregson handed over Australia's first deposit of seed – including 301 types of field pea and 42 rare chickpea samples from the Horsham genebank – for safekeeping at the vault, which stores duplicates of seeds from collections around the globe. He was joined by Professor Edwina Cornish, a member of the Fund's Victorian Committee and Deputy Vice-Chancellor (Research) at Monash University, Mr James Choi, Australian Ambassador to Denmark, and Dr Cary Fowler, Executive Director of the Global Crop Diversity Trust, which operates the vault in partnership with the Norwegian Government and the Nordic Genetic Resource Center in Sweden. The Fund managed the media effort around the visit, generating reports by national TV, radio and print outlets around Australia.



THE HON JOHN KERIN, CRAWFORD FUND BOARD CHAIR, WITH DR JULIAN CRIBB AT THE LAUNCH OF *THE COMING FAMINE*.

“ There are a billion people hungry now and unless we do something there will be more over the next 50 years. ”

Food security in the news

June 2011 saw a strong focus on food security in the media in response to efforts by the Crawford Fund related to several issues. The CGIAR Research Program on Climate Change, Agriculture and Food Security (CCAFS) report on '*Climate Hotspots*' was highlighted in a range of print and radio reports. Interviews with Dr Holger Meinke, who sits on the Crawford Fund's Tasmanian Committee and the CCAFS Steering Committee, highlighted the urgent need to focus climate change adaptation efforts on people and places where the potential for harsher growing conditions poses the gravest threat to food production and food security. An ABC TV Landline feature raised a broad range of issues from both the international and domestic perspective, and included a range of speakers from the Crawford Fund's State Parliamentary Conference in Brisbane in April.

The first ever meeting of Group-of-20 agriculture ministers, which focused on food security, generated Australian media coverage, with background provided by Fund Executive Director Dr Denis Blight and an opinion piece by the IFPRI Director General, Dr Shenggen Fan.

Youth Ambassadors for communication

The Australian Youth Ambassadors for Development (AYAD) Program is an AusAID initiative that supports skilled young Australians to live, work and contribute to development in Asia, the Pacific and Africa. 'AYADs' work with local host organisations and Australian partners to build capacity, exchange skills and strengthen institutions. Since 2002 the Fund's public awareness program has supported around 20 volunteers in 12-month communication posts at international agricultural research centres.

The volunteers have worked in Indonesia, Fiji, Sri Lanka, Philippines, China, Bangladesh and more recently in Ghana and Kenya. Ms Prue Loney, one of the first 2010–11 placements, is volunteering at the International Water Management Institute in Ghana, while Jane Hawtin has been posted to the Biosciences east and central Africa Hub in Kenya. Both women are assisting with websites, media efforts and public events. More placements are currently underway.



AUSTRALIAN AMBASSADOR TO DENMARK JAMES CHOI (LEFT), EXECUTIVE DIRECTOR OF THE GLOBAL CROP DIVERSITY TRUST CARY FOWLER (CENTRE) AND CRAWFORD FUND BOARD MEMBER TONY GREGSON AT THE SVALBARD GLOBAL SEED VAULT WITH AUSTRALIAN SEED.



CRAWFORD FUND PUBLIC AWARENESS COORDINATOR CATHY READE (RIGHT) FAREWELLS AUSTRALIAN YOUTH AMBASSADOR PRUE LONEY BEFORE SHE LEAVES FOR THE INTERNATIONAL WATER MANAGEMENT INSTITUTE IN GHANA.

Master Classes and Training

In the 2010–11 period the Crawford Fund provided training to close to 1000 people from developing countries through three Master Classes (attended by 103 scientists), 31 training courses (for 829 trainees), and training awards (for 20 individuals). Training participants came from no fewer than 47 different countries (Figure 1). Figures 2, 3 and 4 (on page 15) show how training funds were allocated over the period (differences in the figure totals and the numbers cited here are due to some training, and its funding, overlapping with previous and subsequent financial years).

The global reach of our training

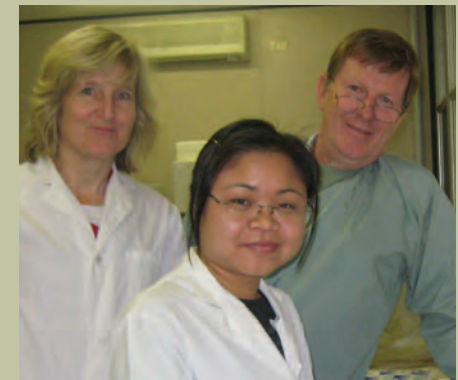


FIGURE 1. TRAINEES WERE DRAWN FROM THE DEVELOPING COUNTRIES INDICATED ON THE MAP – FIJI, SOLOMON ISLANDS AND TONGA NOT SHOWN. TRAINEES FROM AUSTRALIA, CANADA, THE UNITED KINGDOM AND THE UNITED STATES OF AMERICA ALSO PARTICIPATED IN SOME ACTIVITIES.

The Crawford Fund Fellowship

Each year we award the Crawford Fund Fellowship to a young scientist from a less-developed country.

In 2010 Ms Le Thi Minh Hang from the Department of Bacteriology, National Institute of Veterinary Research, Hanoi, Vietnam, was the awardee.



CONNIE TURNI (LEFT) AND PAT BLACKALL WITH Ms Le Thi Minh Hang (centre) at the Agri-Science Queensland Animal Research Institute.

Ms Le spent time at the Agri-Science Queensland Animal Research Institute in Brisbane working on diagnostic tests for respiratory diseases of pigs. Her four-week research project involved the development of a rapid diagnostic test for the bacterium *Streptococcus suis*, a cause of serious respiratory disease in pigs and associated, fortunately rarely, with fatal infections in humans.

Her training will ultimately help provide more sustainable and cost-effective disease prevention and control programs for pig producers in Australia and Vietnam.

MASTER CLASSES

Master Classes are critical to the Fund's goal of strengthening the research, training and extension capacities of developing countries and to build partnerships between those countries' researchers and Australian institutions and scientists. Master Classes are aimed at mid-career, relatively senior scientists or policy-makers from developing countries who already have basic training and are actively working on the topic covered by the class. There is some emphasis recently on classes that enhance the management of technology transfer for agriculture in developing countries.

In 2010–11 the Fund conducted four Master Classes covering the following topics:

- **Collaborative plant breeding** (University of Western Australia, Perth). At this Master Class, scientists from the University of Western Australia also discussed collaboration with participants from the African Center for Crop Improvement at the University of KwaZulu Natal, sponsored by the Alliance for a Green Revolution in Africa.
- **Surveillance, identification and management of citrus diseases** (Gadjah Mada University, Yogyakarta, Indonesia). This Master Class also provided the venue for discussions and an agreement about collaboration between the University of Gajah Mada and the Government of East Timor. See *Addressing the threat of a deadly citrus pest*, right for an account of the impact of this class.
- **Risk management and systems modelling** (International Livestock Research Institute facility, Addis Ababa, Ethiopia). This Master Class drew participants exclusively from Africa, illustrating how the Fund is extending its geographic coverage to that region.
- **Soil-borne pathogens of cereals** (Eskisahir, Turkey). Participants from North African countries attended this Master Class, which followed the success of similar Master Classes, including one that fared very well in an independent review by the Centre for International Economics (see *\$20 million benefit from just one Master Class* on page 14). This initiative may provide the basis for an expanded Australian aid effort in North Africa.

We also welcome Australian scientists to these Master Classes, with funding from their institutions or other non-Crawford Fund sources. Their participation contributes to the Fund's objective of increasing the international engagement of Australian scientists and building networks and partnerships with counterparts from developing countries.

We are developing a Master Class in Communications, which will serve another important Fund objective: helping developing-country research institutions increase public awareness of the benefits of investment in international agricultural research in their own countries. It will also contribute to one of the recommendations of the recent Review of the Australian Aid Program.

Addressing the threat of a deadly citrus pest

The Crawford Fund is working to improve biosecurity skills in neighbouring countries and help keep Australia's citrus industry safe from the one of worst diseases of citrus, including oranges, grapefruits, lemons and limes. The devastating citrus greening disease – also named huanglongbing (HLB) – was the focus of a Master Class held in early 2011 in Yogyakarta, Indonesia. Attended by 44 plant protection scientists from 16 countries, including Australia, and led by scientists from the University of Western Sydney and Indonesia's Gadjah Mada University, the class developed participants' skills in the diagnosis and management of HLB.

According to Dr Eric Craswell, Director of Master Classes at the Crawford Fund, 'HLB has earned the reputation as the worst disease of citrus that is spread by an insect. The disease is currently rife in most South and Southeast Asian countries and southern China and also in Florida and Brazil.' Concern about the entry of HLB into Australia, until now free of the disease, was expressed at a February meeting of the Rural Affairs and Transport References Committee of the Australian Senate.

Although the primary focus of this Master Class is to help plant protection experts from developing countries in Asia and the Pacific to improve their skills in the diagnosis of HLB, it also generates significant benefits to Australia. Improved diagnosis and management skills in neighbouring countries reduce the risk that the disease will spread to Australia. Further, by including Australians in the classes, Australia's capacity to identify the disease is also improved. Thus, if HLB does spread to Australia, it can be contained before it spreads through important citrus industries.

TRAINING

The Crawford Fund operates through State and Territory Committees, each with a Coordinator, a Chair and membership drawn from local business, government and development communities. Examples of other successful training programs, selected by State and Territory Coordinators as best practice, are described in this section of the annual report.

The Crawford Fund Training Program increases the practical skills of scientists and technical personnel employed in agricultural development in developing countries. Government organisations and NGOs participate in the program, which heavily involves public- and private-sector scientific communities in Australia. Some training courses are given in Australia, but most take place overseas.

The program offers short-term, hands-on training. Practical, focused instruction is given to trainees who are selected from, and return to, ongoing research and development projects in countries in which Australian firms, institutions or agencies are already playing a role. Training can either be individual, through a training award (Figures 2 and 3), or in a group through training courses (Figure 4).

State and Territory Committees offer training awards for individuals from developing countries, and facilitate training courses – provided by Australian institutions often in association with institutions in developing countries – according to particular areas of work or geographic locations so as to achieve maximum impact. Some activities are jointly funded by two or more State and Territory Committees. This section offers examples of training activities in five key areas: plant pathology and biosecurity; soil management; environmental protection; crop improvement; and livestock health.

\$20 million benefit from just one Master Class

Master Classes can have marked impacts on the individual trainees, the institutions to which they return, and rural development in their countries more broadly. One of the best examples of this is a 12-day class on soil-borne pathogens of wheat, which took place at Henan Agricultural University, China, in May 2005. Of the 21 participants, most were professors or associate professors of plant pathology.

The Fund engaged the Centre for International Economics (CIE) to review the economic impact of this Master Class.¹ The overall direct and indirect cost of the class, including opportunity costs of participants, was estimated at around AU\$200,000.

CIE reported that the class has had a major and important impact. In particular, there is strong evidence to suggest it directly led to increased awareness of a very high prevalence – and major deleterious impact – of the plant pest cereal cyst nematode (CCN) on wheat production in Henan and three adjacent provinces (Anhui, Hebei and Shandong). This in turn led directly to increased research effort on CCN, which was previously not considered an important pathogen of wheat in China.

CIE calculated a conservative estimate of potential benefits of around \$20 million as a result of bringing forward by only one year the benefits of yield improvement resulting from control of CCN in China. This is a very high return for the relatively low outlay and illustrates the potential benefits of capacity building activities. Further, following the Master Class, a new series of research projects and research networks have been established to examine CCN in more detail. This increased focus appears to be a direct consequence of the Master Class.

While the potential benefits to Australia are not as direct, they are likely to have manifested through improved knowledge of CCN and the overall problem, new research networks, and the gains that flow from increased income of an important trading partner.

¹ Centre for International Economics (2009). *Potential economic impact of a Crawford Master Class: soil borne pathogens and cereal cyst nematode*. CIE, Canberra. Available at www.crawfordfund.org/resources/doc.html?publication=281&rt=4

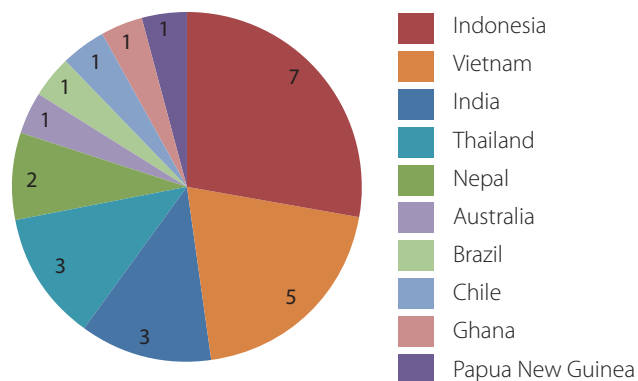


FIGURE 2. DISTRIBUTION OF TRAINING AWARDS, 2010-11

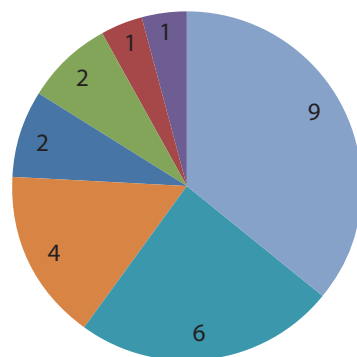


FIGURE 3. TRAINING AWARDS GRANTED BY STATE AND TERRITORY COMMITTEES, 2010-11

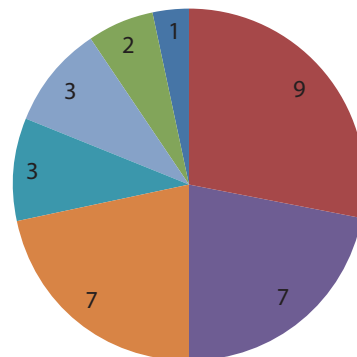


FIGURE 4. TRAINING COURSES DELIVERED BY STATE AND TERRITORY COMMITTEES, 2010-11



Plant pathology

Plant pathology and biosecurity were a major focus of training activities in the year under review. For example, the **Northern Territory** Committee supported a joint project with **Queensland** and **New South Wales** to fund 26 overseas participants at the joint conference of the Asian Association of Societies for Plant Pathology and the Australasian Plant Pathology Society entitled *New frontiers in plant pathology for Asia and Oceania*. Of particular interest was the workshop associated with the conference entitled *Bacterial diseases of bananas in the south-east Asian region and worldwide*.

'Lab to land' theory

Dr K. Annapurna, Principal Scientist of the Division of Microbiology at the Indian Agricultural Research Institute, travelled to Australia with the help of The Crawford Fund in August 2010 to spend time at CSIRO labs in various parts of the country. Her visit promoted interaction with Australian researchers involved in plant-microbe research. Dr Annapurna visited CSIRO and university research labs in **Queensland**, the **Australian Capital Territory** and **South Australia** and held discussions with a diverse group of researchers with specific expertise in soil microbiology, soil-borne disease, root growth, legume nitrogen fixation and farming systems.

During her time at the CSIRO in Brisbane, Dr Annapurna learnt about research on plant-pathogen interactions, particularly with regards to genomics of *Fusarium*, a genus of plant fungi, some of which can damage crops or produce toxins that are hazardous to humans. Discussions with researchers on crown rot were particularly beneficial given the number of wheat areas in India affected by the disease.

Dr Annapurna's experience in Australia will help her to conduct farm-systems research, particularly on soybean-wheat crop systems, in more practical ways. A key aspect of her training was guidance on how laboratory findings can be integrated into field applications and how molecular tools can be applied to field-based research.

Dr Vadakattu Gupta, Senior Research Scientist with the Soil Ecology team at CSIRO Entomology, provided mentorship during Dr Annapurna's stay. Dr Gupta pointed out that the training on using quantitative DNA methods to determine changes in specific microbial groups in field-based evaluations could form the basis of a future collaborative research project. The visit also helped Dr Annapurna gain a better appreciation of the concept of biological disease suppression and its role in disease management in field crops.

Controlling root disease

Improved root disease control has the capacity to significantly increase plant productivity in China's Gansu province and could also provide environmental benefits such as increased adoption of minimum tillage and stubble retention practices, leading to improvements in soil fertility and a reduction in erosion.

The Fund and CSIRO supported a research trip to Australia by Dr Li Jinhua, a postdoctoral fellow from the Department of Plant Pathology at Gansu Agricultural University. Dr Li spent one year researching and working with scientists at the Soil Microbial Ecology Team of CSIRO Entomology, **South Australia**. Her research focused on the microbial suppression of root-disease complexes in cropping systems.

Working with CSIRO colleagues, Dr Li completed the molecular taxonomic component of her research project, providing her with a number of techniques for rapid DNA-based diagnosis of important soil-borne plant pathogens common to both Australian and Chinese plant-production systems.

Dr Li participated in field research and helped sow and monitor cereal root-disease suppression trials in South Australia and **New South Wales**. Her analyses indicated significant differences among pathogen populations at the two different locations. The completion of this work delivered a major novel research output related to efficacy of root-disease suppression.

Soil management

Soil management, an area often neglected by international agencies, is another important focus for the Fund. Activities highlighted by our State and Territory Coordinators included a tour by Mr Enamul Haque, sponsored by the **Western Australia** Committee (the major sponsor) and the New South Wales Committee. As a result of this, Mr Haque has developed a versatile minimum-tillage planter suitable for Bangladesh, which shows great potential for expanding no-till agriculture in Bangladesh.

A workshop on the preparation of a rhizobium manual may well prove to be a major contribution to soil improvement. Professor John Howieson, director of Murdoch University's Crops and Plants Research Institute, was supported partly by the Fund to run a writing workshop to prepare a modern methods manual for rhizobium technologists. The Western Australia Committee supported chapter writers from Kenya and Nigeria.

The good oil on oil palm

With support from the Fund, Dr Murom Banabas, Head of Agronomy Program, Papua New Guinea Oil Palm Research Association (PNGOPRA), visited Australia in April 2011 for training on participatory modelling. The training, at James Cook University, **Queensland**, will help Dr Banabas and colleagues improve oil palm cultivation, which is an important industry for smallholders in Papua New Guinea. The training was run by James Cook University's Professor Jeff Sayer and the Millennium Institute's Dr Andrea Bassi.

The modelling – which allows various industry scenarios to be considered and thus aids with decision-making – can be used for planning, monitoring and evaluation not only for oil palm production, but also for other industries. Once a particular model has been built it can be used to explore scenarios, test ideas and approaches, and put economic values on the costs and benefits of different courses of action. The model can then be used as a basis for discussing trade-offs and informing policy discussions.

Dr Banabas said that the training gave him a way of systematically looking at a situation, linking the various components and ultimately deciding where to intervene to have maximum or minimum impact. He also said that it is easily understood by others because it can be shown diagrammatically to give a clear picture of the relationships between the various components.

Dr Banabas has already used the model at an industry meeting in his home country, using it to highlight potential ways to increase production. He plans to use it at another meeting, scheduled for late 2011, which will be attended by all PNGOPRA agronomy supervisors and agronomists. The model will help PNGOPRA consider how its Agronomy Program can contribute to increasing oil palm production, productivity and profitability. PNGOPRA aims to more than double smallholder yields from their current annual yield of 10–15 tons per hectare. In particular, the model will help show how the agronomy section can increase yields through improved dissemination of information to extension officers and plantation staff.

Soil fertility in Papua New Guinea

In an attempt to address dwindling human-resource capacity in soil chemistry and plant nutrition, Ms Debbie Kapal, an agronomist with the Farming Systems Improvement research theme of Papua New Guinea's National Agricultural Research Institute (NARI), received Fund training assistance to attend the inception and implementation meeting of an ACIAR–Oil Palm Research Association oil palm sustainability project in West New Britain Province in May 2010. The Australian base for the project is at the James Cook University in Townsville, **Queensland**. Ms Kapal is also involved in soil-fertility management and coffee-farming projects.

As NARI's only senior soil chemist/plant nutritionist at present, it is crucial for her to establish links with other scientists working in Papua New Guinea. Given her interest in new areas of research such as nitrogen fixation measurement techniques, oil organic matter management, and the development of indicators of sustainability in agricultural production systems, it was important for her to learn about the oil palm sustainability project, which involves research on these topics. The meeting enabled Ms Kapal to gain new knowledge and project insights by discussing issues with the scientists involved. These connections are leading to collaborative research that is certain to assist with the training of scientists in NARI in these new research areas.

Support for similar research projects in the highlands of Papua New Guinea is likely to result from the networking that took place at the meeting. Work has already begun on addressing the identification of high nitrogen-fixing legumes required to improve and maintain sweet potato- and coffee-based cropping systems for subsistence farmers.

Focus on no-till for Chile

No-till farming improves soil structure and nutrient recycling, reduce soil evaporation, and decreases wind and water erosion. To learn more about the technique, Dr Paola Silva Candia from the Faculty of Agronomy at the University of Chile travelled to Australia in August 2010 with assistance from the Fund.

'I needed to understand the Australian agriculture systems and the technological changes in Australia which facilitated no-till development and adoption. I also wanted to understand how farmers were convinced to use this system and what research has been done to improve productivity in no-till systems,' Dr Silva said.

Her visit included meetings, field visits with research and extension agronomists, and participation in field days in **New South Wales** and **South Australia**. She also joined teams of scientists at CSIRO in the **Australian Capital Territory**; CSIRO, the South Australian Research and Development Institute and the University of Adelaide in South Australia; and scientists from Wagga Wagga, Condobolin and Tamworth in New South Wales.

As well as learning about Australia's no-till system, Dr Silva made valuable contacts, particularly at Charles Sturt University, who will benefit her future research. On her return to Chile she organised a hands-on no-till farming workshop and compiled a manual on durum wheat.

She is working on new education sessions for her undergraduate and postgraduate students to show them crop-production principles in the hope of increasing yields in Chilean farmers' fields.



AGRONOMIST DEBBIE KAPAL (RIGHT) LEARNS ABOUT OIL PALM PHYSIOLOGY WITH STEVEN NAKE FROM THE OIL PALM RESEARCH ASSOCIATION AND CSIRO'S MIKE WEBB (LEFT).



DR PAOLA SILVA CANDIA (LEFT) AND CRAWFORD FUND ACT COORDINATOR DR TONY DISCUSS NO-TILL FARMING.

Digital soil mapping

Mr Yiyi Sulaeman from the Indonesian Center for Agricultural Land Resource Research and Development is a young researcher with considerable experience in soil surveying and mapping in his home country. Soil information is essential in agricultural production in Indonesia, where farmers, extension agents and policy-makers need comprehensive information on their soil conditions to determine the best inputs and practices to be employed. However, current methods for soil mapping employed in Indonesia tend to be time-consuming, inefficient and expensive.

Mr Sulaeman visited the University of Sydney in **New South Wales** to learn a new discipline, digital soil mapping, which has been largely developed in Australia. He was able to learn new techniques in advanced application of geographical information systems, terrain analysis, soil landscape modelling, statistical modelling and data mining. This training encouraged him to write journal articles to inform others about the research and work done in Indonesia. He also appreciated time spent with other visiting scientists from research organisations in China, Brazil, Argentina and the United States.

Mr Sulaeman applied the new techniques to two different landscapes in Java as case studies. This study provided a benchmark for further digital soil mapping work in Indonesia, and he can now train other soil surveyors and mappers in Indonesia.

Environmental protection

Safer use of herbicides in Bangladesh

Because of the threat posed by weeds, the use of herbicides in Bangladesh has risen rapidly in the past few years. Although herbicides offer crops effective protection from weeds, if they are not used properly they can be dangerous to human health or lead to the premature development of herbicide-resistant weed. A training program entitled ***Safe use of herbicide and effective weed management*** was held at the Rangpur Dinajpur Rural Service (RDRS) office in Rangpur, Bangladesh, in January 2011 for scientists, extension officers and herbicide marketing agents.

The 21 participants included scientists from the Bangladesh Agricultural Research Institute; the Bangladesh Rice Research Institute; the Department of Agricultural Extension; Bangladesh Agricultural University; Sylhet Agricultural University; the NGOs RDRS Bangladesh and People's Resource Oriented Voluntary Association; and agricultural chemical companies Syngenta and ACL.

The training was led by Abul Hashem, an Australian senior weed scientist from the **Western Australia** Department of Agriculture and Food, and renowned Bangladeshi weed scientist SM Rezaul Karim from Bangladesh Agricultural University. It was coordinated by Md. Enamul Haque, CIMMYT cropping systems agronomist, and KM Marufuzzaman, program manager of RDRS Bangladesh.

Participants agreed that the training substantially increased their knowledge and understanding of weed management, herbicide use and herbicide safety requirements. Most had not previously received such training on herbicide use at university or during their employment with various research or extension organisations.

The training was organised under the collaborative research project '*Addressing constraints to pulses in cereals-based cropping systems, with particular reference to poverty alleviation in north-western Bangladesh.*'

Arsenic exposure under the microscope

Arsenic contamination from the soil into water used for drinking and irrigating crops is a major problem in Bangladesh. It is estimated that some 35 million people suffer from arsenic poisoning through contaminated food and drinking water.

With the help of the Fund, Md. Asaduzzaman from the Department of Agronomy at the Sher-e-Bangla Agricultural University in Bangladesh attended a four-month training program under the mentorship of Dr Mohammad Mahmudur Rahman, research fellow from the Centre for Environmental Risk Assessment and Remediation at the University of South Australia.



YIYI SULAEMAN (RIGHT) SHOWS RESULTS OF HIS DIGITAL SOIL MAP TO PROFESSOR ALEX McBRATNEY (CENTRE) AND DR BUDIMAN MINASNY AT THE UNIVERSITY OF SYDNEY.

Mr Asaduzzaman learnt about the preservation of environmental samples, advanced techniques to analyse contaminants, and the importance of occupational health, safety and welfare practices in the laboratory. A heavily polluted district in Bangladesh was used as a field sampling site, with Dr Rahman assisting Mr Asaduzzaman in collecting drinking water, rice, vegetable and soil samples which were then tested in Adelaide for arsenic and other toxic elements.

Since his return to Bangladesh, Mr Asaduzzaman has taken on two postgraduate students to work on arsenic and has plans for at least one workshop to train field workers.

Further underscoring the effectiveness of the Fund's Training Program, Dr Rahman and Mr Asaduzzaman recently published an article in the journal *Water quality, exposure and health* on arsenic exposure from rice and water sources in the Noakhali District of Bangladesh.

Their research revealed that rice can be an important contributor to the exposure of inorganic arsenic. The article suggested that the government educate rural people about the risk of long-term arsenic exposure through drinking water.

According to Dr John Radcliffe, chair of the Fund's **South Australia** Committee (which funded the training), the experience gave Dr Rahman and Mr Asaduzzaman the opportunity to run a workshop for other scientists from Bangladesh, Vietnam, Cambodia and Nepal. The workshop gave participants a better appreciation of the problems of high arsenic levels in ground waters and the serious health problems that may arise from their use.

Using vegetation to restore sites

The Fund's **Victorian** Committee supported a training course in mining phytoremediation – the use of vegetation to restore disused mine sites – in the Philippines in early January 2011. The course, which comprised lectures and field visits, was led by Dr Augustine Doronila, who presented lectures on key topics including processes of phytoremediation and monitoring the success of restoration programs.

A series of speakers stressed the significance of phytoremediation from different perspectives. Anthropologist Dr Ana Labrador gave insights into the social context of successful implementation of post-mining phytoremediation. Dr Ian Chivers highlighted the ecological significance of native grasses, an often neglected and valuable biological resource.

Dr Michael Forster described how instrumentation can assist in understanding the physiological responses of vegetation in mined land surfaces. Ms Jem Baldisimo, a young researcher in bioremediation, spoke of her own recent work in Stawell, Victoria, mitigating the effects of mining that degrade the health of soil microbial communities.

Assessing fruit quality

Ms Baiq Nurul Hidayah, a researcher at the Agriculture Technology Research Center, West Nusa Tenggara, Indonesia, undertook a training program to increase her skills and knowledge in assessing mango and rambutan quality for export. She worked on farms and in laboratories in the **Northern Territory**, where she participated in the assessment of fruits at harvest for biological, physical and nutritional factors that had caused a reduction in quality.

Any fruit blemishes were judged against the quality benchmarks established for growers. She also learnt the basics of identifying the causes of quality loss, a process that involved extensive sampling of insects and laboratory processing of samples.

Livestock health

Fighting rabies in Nepal

Dr Ganesh Pant from the Rabies Vaccine Production Laboratory in Kathmandu, Nepal, was supported by the Fund on a visit to CSIRO's Australian Animal Health Laboratory (AAHL) in 2003. On that trip, he received advanced laboratory training to enhance his diagnostic capability and to strengthen cooperation and collaboration between Nepalese and Australian institutions.

More recently AAHL has helped Nepal's Central Veterinary Laboratory and Rabies Vaccine Production Laboratory by testing samples of Japanese encephalitis, avian influenza, Newcastle disease, pseudo-rabies and rabies. The laboratory has also provided Nepal with reagents and other materials to help build the country's diagnostic facility.

In November 2010 Dr Pant visited Australia once more with the help of the Fund. This time he learnt new techniques and delivered an oral presentation, *Overview of rabies in Nepal*, at the Sixth Annual Meeting of the Australian Association of Veterinary Laboratory Diagnosticians, held in Brisbane.

He has already transferred the newly learnt techniques to the laboratory in Nepal, where they will be vital for the diagnosis and production of tissue culture to produce an anti-rabies vaccine. The control of rabies – a disease of priority in Nepal – is possible only via regular mass vaccination of dogs. Local production of the vaccine will make it cheaper and more readily available. Read more about the Dr Pant and the impact of this work on page 22.

Nutrition for marketing ruminants

With the aim of improving the efficiency and production of Laos's livestock industry, the Fund's **New South Wales** and **Victorian** Committees sponsored a series of workshops on ruminant health, production and marketing in northern Laos in June 2010.

The workshops, attended by staff from the Lao Department of Livestock and Fisheries, were coordinated by the University of Sydney's Professor Peter Windsor, Dr Russell Bush and Ms Lyn Henry, as well as the department's Ms Luzia Rast and Dr Syseng Khounsly. The workshop was facilitated by Mr Sonevilay Nampanya who recently returned to Laos after completing a four-year degree in Animal Science at the University of Sydney.

Participants learnt about applied large ruminant nutrition and marketing. The knowledge they gained will enable departmental staff to help farmers to increase their efficiency in beef and buffalo production and reproduction.

By improving the levels of education within the industry, it is hoped that smallholder farmers will be able to enhance their incomes and help reduce the amount of poverty in remote rural communities in Laos. The participants had also taken part in five previous livestock industry workshops. This latest session allowed them to build upon their knowledge – especially in areas such as bull breeding and castration techniques – of topics of interest that they had touched on previously.

Women without borders

With support from the **New South Wales** and **Northern Territory** Committees, five women from Papua New Guinea were awarded scholarships to attend the 'Women without borders' training event in Darwin in September 2010. The training was organised by two peak national NGOs – Australian Women in Agriculture (AWiA) and Women's Industry Network Seafood Communities. The five scholarship holders formed part of a delegation of 15 women and one man representing the Papua New Guinea Women in Agriculture Development Foundation (PNGWiADF).

During their five-day trip, the participants visited agricultural businesses including a crocodile farm, mixed horticulture farm, barramundi farm, live cattle export yards, a farm forestry and mill facility, and the Mindil markets in Darwin.

Two technology sessions included topics on accessing and using modern telecommunications; getting the best and most cost-effective service available; and how to benefit from services such as Skype, Twitter, Facebook and other social networks.

Following the training, members of AWiA have continued to work with their Papua New Guinea counterparts to implement some of the actions in PNGWiADF's strategic plan. Proposed activities include a leadership course in Papua New Guinea in 2011 and an international conference of women in agriculture in India in 2012. Discussions are now underway with Ms Jan Kintze – a Darwin-based post-harvest plant specialist who runs her own tropical plant business – to visit PNG and provide hands-on, practical skills training to members of PNGWiADF.

Read about PNGWiADF President Maria Linibi on page 23.



CIAT

Crop improvement

Breeding goodness

With the onset of climate change, the temperate regions of Australia are predicted to experience an increase in hotter days and in rainfall. Although this is set to have a negative impact in the country's subtropical forages, there are no breeding programs currently addressing this issue in Australia.

With the Fund's support, members of East Timor's Seeds of Life project were able to train for three months in Australia in the areas of plant breeding, trailing and seed production of tropical forages. Mr Anthony Leddin, a plant breeder from Valley Seeds in **Victoria** assisted with the training.

It is hoped that the project will encourage independent breeding programs in East Timor to support important food crops that are currently not part of any existing breeding programs.

Improving crops in West Africa

PhD students based at the West African Centre for Crop Improvement (WACCI) in Ghana were able to fine-tune their scientific skills thanks to a co-sponsored Crawford Fund–WACCI–Cornell University course. Students participating in the *Applied genomics and crop improvement* module came from Mali, Burkina Faso, Ghana, Niger and Nigeria.

With assistance from the Fund, Dr Evans Lagudah, Senior Principal Research Scientist at CSIRO Plant Industry in the **Australian Capital Territory**, presented the module. Dr Lagudah is experienced in integrating molecular and conventional approaches to crop improvement.

Dr Lagudah reported that by emphasising the staple crops of West Africa, the course was very relevant to the breeding objectives of crops in sub-Saharan Africa. Individual sessions with the participants gave them an opportunity to refine their experimental research project proposals, which deal with various aspects of yield and nutritional improvement. It also allowed them to learn more about ways of overcoming problems in crops such as maize, sorghum, rice, sweet potato, cassava ground-nuts and cowpea.

Salinity and chickpeas in India

Chickpeas are sensitive to salinity, which is a major problem in India and Pakistan, where over 85% of the world's chickpeas are grown. Scientists in both countries, and at ICRISAT in India, have identified salt-tolerant types of chickpea, but they do not generally yield well.

To learn more about the role of salinity on the reproductive physiology of chickpea, The Crawford Fund sponsored Ms R. Pushpavalli to travel to Western Australia where she spent time at the Centre for Legumes in Mediterranean Agriculture at the University of **Western Australia**. During her trip, Ms Pushpavalli, who came to Western Australia after completing a MSc degree in India and before commencing a PhD program at ICRISAT, received training on the influence of and measurement of salinity, as well as pollen viability and pollen tube germination.

With climate change predictions indicating a hotter and drier future for India and the semi-arid tropics, and the observations that heat and drought stress can have a large negative effect, it is important to determine the mechanisms of these environmental stresses on reproductive physiology.

Ms Pushpavalli felt that the training had equipped her to make significant progress in understanding the effects of high temperature and drought and the variation among different types of chickpea for heat and drought tolerance at the reproductive stage. She will employ the techniques she learnt in breeding populations in India for a range of crops to develop salt- or drought-tolerant germplasm for breeders.



**THE APPLIED GENOMICS AND CROP IMPROVEMENT
TRAINING GROUP**



**MS PUSHPAVALLI IN A UNIVERSITY OF WESTERN
AUSTRALIA GLASSHOUSE.**

Crawford Fund Trainee

DR GANESH PANT



GANESH PANT AT WORK IN AN AAHL LABORATORY.

Japanese encephalitis and rabies in Nepal

Dr Ganesh Pant, an expert on Japanese encephalitis, works at Nepal's Rabies Vaccine Production Laboratory (RVPL) in Kathmandu. Before moving to RVPL in 2008, he worked at the Central Veterinary Laboratory (CVL) in Kathmandu and the Regional Veterinary Laboratory (RVL) in Surkhet.

Japanese encephalitis was first reported in Nepal in 1978. Since then, recurring epidemics have killed more than 4000 people and inflicted substantial harm to the rural pig industry. In 2003, the Crawford Fund provided a traineeship at the Australian Animal Health Laboratory (AAHL) in Geelong, where Dr Pant developed skills in diagnosing Japanese encephalitis.

On his return to Nepal he trained two lab technicians and established a diagnostic facility at CVL for monitoring the disease in humans and animals.

Dr Pant received further support from the Fund for training at AAHL in 2010, when he extended his expertise in Japanese encephalitis and rabies, and also learnt about avian influenza and foot-and-mouth disease. He also attended the Sixth Annual Meeting of the Australian Association of Veterinary Laboratory Diagnosticians in Brisbane and delivered a talk on rabies in Nepal. In October 2011, Dr Pant will pass on his skills at a Fund-supported Rabies workshop in Nepal.

Dr Pant was interviewed about his training at AAHL.

Describe your Crawford Fund-supported training

I learnt laboratory diagnostic skills for Japanese encephalitis, avian influenza, Newcastle disease, classical swine fever, foot-and-mouth disease and rabies at AAHL. I was able to transfer these skills to CVL, RVL and RVPL in Nepal and thus enhance our laboratory capability. In a personal sense, I enhanced my knowledge and skills in the diagnosis of animal diseases and developed my career in this field. My training also helped establish institutional relationships between Australian and Nepalese laboratories for collaborative research work on Japanese encephalitis, avian influenza and rabies.

What impact has the training had on disease diagnosis and control?

We were able to reduce the incidence and case fatality of Japanese encephalitis in Nepal after adopting the vaccination policy according to the findings of our collaborative research. AAHL has provided reagents of Japanese encephalitis, avian influenza, brucellosis and

rabies to facilitate our diagnostic work at CVL. AAHL has also helped us by testing our samples of different diseases and providing results in time for us to keep these diseases under control.

We organised laboratory training on avian influenza at CVL in Nepal with the help of AAHL. Two AAHL staff, Dr Paul Selleck and Ms Kelly Davies, visited CVL in Nepal and trained our laboratory personnel in the diagnosis of avian influenza. This has enabled us to perform laboratory tests on the samples collected during surveillance of avian influenza in Nepal. Our laboratory officers and technicians were therefore able to diagnose 10 bird flu outbreaks in Nepal in 2009 and 2010. Our five veterinary officers were also trained at AAHL in 2010.

How will the rabies workshop benefit Nepal?

The rabies training will strengthen our diagnostic facilities and capabilities in the prompt diagnosis of rabies at our veterinary laboratories. Between 100 and 200 people die from rabies every year in Nepal, and 35,000 people need post-exposure treatment. Only CVL has a laboratory diagnostic facility, and it is important to extend this to RVL. The workshop will help us do this.

How do you plan to use your new skills and knowledge in the future?

We would like to extend RVL's diagnostic capacity by providing training to laboratory personnel. I would like to collaborate with AAHL on rabies virus isolation, molecular characterization of isolated virus, developing rabies vaccines, and the molecular epidemiology of rabies in Nepal. I will use these skills to develop effective and safe vaccines for people and animals in Nepal, and will transfer these skills to others so that we can control rabies in my country.

Crawford Fund Trainee

MARIA LINIBI



MARIA LINIBI (LEFT) AND RUFINA PETERS (RIGHT) ARE THANKED BY KYLIE PAULSEN, PRESIDENT OF THE WOMEN'S INDUSTRY NETWORK SEAFOOD COMMUNITIES.

Maria Linibi heads Papua New Guinea Women in Agriculture Development Foundation (PNGWiADF), which provides a national focus for provincial and village agricultural NGOs that support women, assist with extension and networking, and provide a stronger voice for women in agriculture. Ms Linibi worked as a public servant for many years before leaving to join her husband on their farm. They became innovators, producing crops previously unknown to the area and working to disseminate this knowledge among other farmers.

With Fund support, AWiA helped Ms Linibi establish PNGWiADF in 2006. Ms Cathy McGowan AO, a past president of AWiA, describes Ms Linibi as a woman of amazing foresight and extraordinary energy, whose vision is to help the people of her country become self-reliant in agriculture. In particular, she wants women – who produce 85% of Papua New Guinea's food – to have access to the training and knowledge needed to improve their agricultural productivity and their livelihoods.

Ms Linibi was interviewed about her experience with the Crawford Fund.

How did you become involved with the Crawford Fund?

In 2004, I was invited to speak at a conference in Brisbane. On this trip, I was introduced to Cathy McGowan and AWiA. I realised that this type of organisation was very much needed in Papua New Guinea, and was inspired to establish PNGWiADF. Cathy was able to put me in touch with the Crawford Fund, which provided a small amount of seed funding in 2007 and since then has supported us every year. It has been the only foreign organisation to fund Papua New Guinea women in agriculture.

What impact has the Fund had on you and your organisation?

There are several key activities the Fund has enabled. It has taken PNGWiADF members to Australia for training, funded experts to come to Papua New Guinea to conduct workshops, and supported visits to Australia by our members to see how Australian NGOs operate. These visits in particular have allowed us to create links and expand our network internationally. There is a real sense that the Fund's people really care about us, meeting with us regularly and providing mentor services.

One of the most impressive things about the Fund is how quick and flexible it has been in responding to our needs. The funding has been timely, flexible and most importantly strategic. By strategically investing relatively small amounts of money, the Fund has made a big difference. We have been able to leverage the funding with other local organisations to achieve big results. For example, during the 2010 visit to Darwin, we met horticulturalist Jan Hintze. Recognising the potential for her to help our members, the Fund quickly supported her visit to Papua New Guinea in May 2011 to deliver horticulture training.

How did the training in horticulture help your members?

We discussed the harvesting of flowers – both from the point of view of looking after them, as well as making sure the plant was maintained properly for future production. Participants learnt about trimming foliage, recycling unwanted flower material, and the best age for flowers to be harvested. Post-harvest treatment was also covered, since all the care during growing and harvesting can be negated if the flowers are not treated correctly after they're cut. More than 90 participants attended the course – far exceeding the expected maximum of 40.

What is PNGWiADF's role in Papua New Guinean agriculture?

Since PNGWiADF was established, it has grown rapidly and now has 90 registered groups and 18 associate members representing more than 5,000 women across 19 provinces. Women have a strong drive to improve their agricultural practices and wellbeing through information sharing and exchange, training, and practical support. Many women in rural areas are now able to link up with other women farmers, and their affiliation with PNGWiADF allows them to share knowledge with, and learn from, other groups. Provincial and local groups are building their plans around the national PNGWiADF Strategic Plan.

A Wider Canvas for International Agricultural Research

The Crawford Fund is pleased to announce a new research study on emerging trends in world food security and their implications for international agricultural research. The study, *A wider canvas for international agricultural research*, will analyse the emerging trends that will affect the future research agenda and identify potential new funding streams for such research. It will also demonstrate the benefits of investments in international agricultural research.

Dr Gabrielle Persley of the Doyle Foundation is leading the study. Dr Persley was a foundation staff member of ACIAR and co-author of the 2008 Crawford Fund Task Force Report on World Food Security.

The study takes place in the context of renewed concerns about world food security and a recurrence of factors that led to the food price spike that shocked the world in the first half of 2008. These factors include the competition among grain crops for use as food, feed or biofuels; the rising price of oil, which in turn increases the costs of agricultural inputs, particularly fertilizers and pesticides; and the lack of affordable credit. All these issues have negative impacts on small-scale farmers in their efforts to increase productivity and generate surpluses for sale in local, regional and international markets.

World food prices are now close to their 2008 peaks. According to the World Bank, world prices in mid-2011 are 36% higher than one year previously, with some foods and regions more affected than others.

Although the latest price increases have serious implications for small-scale farmers, livestock keepers, and poor consumers in the burgeoning cities of the developing world, they have not attracted as much worldwide media attention in 2011 as they did in 2008. In 2011, the world news media have concentrated on a series of natural disasters (earthquakes, floods and fires) in various parts of the globe and on the political unrest throughout the Arab world. Nevertheless, these phenomena – natural disasters, record highs in food prices and political developments – are interrelated. Food price increases trigger hoarding and restrictive trade policies, which in turn can trigger further market responses, higher prices and more social unrest.

Drought and political unrest have led to the recurrence of famine in the Horn of Africa, attracting news headlines and emergency responses.

We have identified a number of emerging trends for analysis, and will present a selection of case studies. The analyses will draw initially on the wealth of material available in the Crawford Fund Parliamentary Conferences 2007–11. These conferences have addressed important issues along the continuum of food security, poverty, natural resources and the environment. The study will also take account of the new *Strategy and Results Framework* developed by the CGIAR. Its findings will inform the development of future Crawford Fund programs, as well as those of other partners. The intended outcomes are:

1. Within each priority topic, identify current gaps and areas for future investments by public and private entities in international agricultural research.
2. Communicate the benefits of international agricultural research more effectively and to a wider audience in Australia and internationally.
3. Specifically for the Crawford Fund, inform more strategic choices of topics for future Crawford Fund Parliamentary Conferences and future Master Classes; and identify specific areas for support through Crawford Fund State and Territory committees and their training programs.

The study will present its findings progressively through a series of briefs on key issues (see page 25), published quarterly on the emerging trends in agriculture and food security and the role of international agricultural research. These briefs and related media and communications outputs on each topic are intended to inform and influence politicians, policy-makers and others with interests and responsibilities in food security, agriculture and international development. The briefs will be available at www.crawfordfund.org.

BRIEFS ON KEY ISSUES

1. Overview of *A wider canvas for international agricultural research*.
2. **Biodiversity, agriculture and food security:** conserving and using plant and animal genetic resources (Crawford Fund Parliamentary Conference 2010).
3. **Biosecurity, agriculture and plant health** and their importance in ensuring global food security. This issue emerged from the 2010 Crawford Fund Parliamentary Conference and is linked with Plantwise, an initiative on global plant health being developed by CAB.
4. **Climate change, agriculture and food security:** mitigation and adaptation to climate change to achieve environmental and food-security objectives; ways of drawing on the broader pool of resources that may emerge from international climate-change agreements (Crawford Fund Parliamentary Conference 2009).
5. **Private sector R&D and food security:** the current and future contribution of private sector R&D towards ensuring food security (Crawford Fund Parliamentary Conference 2008).
6. **The supermarket revolution in food:** the impact on agriculture, food security, farmers, consumers and retailers; and the scope for investment by multinational supermarkets in international R&D (Crawford Fund Conference 2011).
7. **New approaches to international research funding** from the human health sector, including advanced market commitments (contracts that guarantee a viable market for a product so as to promote private-sector investment) that encourage the development of new vaccines and drugs for the treatment of 'orphan' diseases (those neglected by the pharmaceutical industry because they are unlikely to be profitable).
8. **Communication of international agricultural research outcomes** through public extension services, community-based organisations and private agencies; the increasing importance of mobile phones and social media as means of communication among farmers and communities in the developing world; and the role of public awareness campaigns in increasing international engagement in agricultural research and increased funding for national and international agricultural research systems from governments, the philanthropic sector and the private sector – a key mission for the Crawford Fund.
9. **New trends in science,** including the use of genetically modified organisms to increase productivity and the sustainability of agriculture in the developing world over the coming decades.
10. **Synthesis of findings and recommendations from Briefs 1–9:** Communication of key findings to policy-makers; identification of gaps requiring further research.



CIAT



CIAT

Directors' Report

The printed Annual Report includes the following extracts of the financial accounts: the Operating Result to 30 June 2011, Statement of Comprehensive Income for the Year Ended 30 June 2011, Statement of Financial Position as at 30 June 2011, Statement of Changes in Equity for the Year Ended 30 June 2011, Statement of Cash Flows for the Year Ended 30 June 2011, the Directors Declaration, and the Independent Auditors Report. Full accounts, including a Summary of Significant Accounting Policies and Information on Directors is published at www.crawfordfund.org.

Crawford Fund Limited

ABN 86 141 714 490

Financial Report for the Year Ended 30 June 2011

DIRECTORS' REPORT

Your directors present this report on the company for the financial year ended 30 June 2011.

Principal Activities

The principal activities of the company during the year, which are set out in an accompanying Annual Report, were:

- The conduct of 35 specialist training courses in Australia and the developing countries;
- Specialist training activities in Australia for 24 developing country scientists;
- 3 Master Classes on key topics in international agricultural research;
- The Annual Crawford Fund Parliamentary Conference conducted in Parliament House on 30 August and 1 September 2010. The Conference, which was attended by approximately 300 people, focussed on Biodiversity and World Food Security. For the first time, the Fund also conducted a State Parliamentary Conference at Parliament House in Brisbane on tropical agriculture which was fully subscribed. Both events attracted media attention and provided opportunities for additional stakeholder meetings.
- A series of other public awareness activities including media interviews and promotions on the contribution of research to sustainable agriculture and the management of natural resources in the developing world and Australia. Notable amongst these journalist visits to East Timor, Philippines, Syria, Vietnam and Laos; media attention for Master Classes and other Crawford Fund training; partnering for media assistance with key agriculture and agronomy conferences; and ad hoc media outreach on food security issues.

The company conducts assessments of the impact of its activities to measure their contributions to the achievement of its objectives. The Directors are satisfied that all of its activities are contributing satisfactorily either directly or indirectly to the promotion and application of science and technology to ecologically sustainable agriculture.

Objectives

The principal objective of the Company is to promote the application of science and technology to the practical purpose of ecologically sustainable agriculture development and the effective management of natural resources, in the developing world and in Australia.

Further objectives of the Company are to: make more widely known the benefits that accrue from international agricultural research; encourage greater support for, and participation in this research by Australian governmental and non-governmental organisations and in particular the industrial and scientific communities of Australia; work together and in conjunction with the community in the developing countries; undertake cooperative activities and develop relationships with existing organisations to provide support for the communities; and do such other things as are incidental or ancillary to the attainment of the objects of the Company.

Governance

The names of each person who has been a director during the year and to the date of this report are:

Dr Robin J Batterham
 Prof Ross G Garnaut
 Em Prof Helen M Garnett
 Mr Terence J Enright
 Ms Sallyanne Atkinson
 Dr John C Radcliffe
 The Hon John D Anderson
 Dr Denis G Blight
 Dr Tony K Gregson

DIRECTORS' REPORT

The Hon Neil Andrew
 The Hon John C Kerin
 Mr Michael J Taylor
 Dr Margaret L Hartley
 Mr Ian M MacKinnon

Directors have been in office since the start of the financial year to the date of this report unless otherwise stated.

Seven of the Directors had special responsibility to Chair a State and Territory Committee of the company as follows:

The Hon John D Anderson – NSW
 The Hon John C Kerin – ACT
 Mr Terence J Enright – WA
 Ms Sallyanne Atkinson – QLD
 Em Prof Helen M Garnett – NT
 Mr Ian M MacKinnon – TAS
 Dr John C Radcliffe – SA
 Dr Tony K Gregson – VIC

The Hon Neil Andrew chaired the Board until its meeting on 1 September 2010. He was replaced by The Hon John Kerin, who chaired the Board throughout the rest of the financial year. Dr Denis Blight was the chief executive of the company throughout the financial year and was appointed by the Board to fill this position for a further 4 years subject to review after two years.

In addition, Dr Tony Gregson and Dr Denis Blight served on the Investment and Audit Review Committee of the Australian Academy of Technological Science and Engineering, which body oversees the company's financial accounts on behalf of the Board¹.

The Australian Academy of Technological Science and Engineering is the initial and sole member of the company. Under Article 16.1 of the company's constitution the liability of the member on winding up is an amount not to exceed \$20.

Operating result

As will be evident from the audited accounts, at 30 Jun 2011, there was a net deficit of \$7,360 against a budgeted surplus to the end of June 2011 of \$8,911. The total equity of the company as at 30 Jun 2011 was \$486,123

The total current assets of the company (including non-current) are \$596,170 with \$456,187 cash on hand (includes Interest Bearing Deposit accounts). The total liabilities of the Company are \$110,047. Trade and other receivables are \$65,125 all are current, as are trade and other payables of \$102,047

The main points to be noted are:

- Spending on all programs totalled \$1,257,141 being 99.99% of the company's budget for such programs for the full financial year.
- Funds on all programs for the financial year were fully committed.
- Reserves have been reduced by \$7,360 to \$486,123.

Crawford Fund Limited ABN 86 141 714 490

STATEMENT OF COMPREHENSIVE INCOME FOR THE YEAR ENDED 30 JUNE 2011

	Note	2011
		\$
Revenue from government and other grants	2	1,195,000
Other income	2	289,573
Employee benefits expense		(115,783)
Depreciation and amortisation expense		(6,356)
Rental expense		(27,500)
Audit, legal and consultancy expense		(9,080)
Program expense		(1,257,141)
Other expenses		(76,073)
Profit/(Loss) before income tax		(7,360)
Income tax expense		-
Profit/(Loss) for the year		(7,360)
Other comprehensive income		
Net gain on revaluation of property, plant and equipment		-
Other comprehensive income for the year		-
Total comprehensive income for the year		(7,360)
Profit/(loss) attributable to members of the entity		(7,360)
Total comprehensive income attributable to members of the entity		(7,360)

The accompanying notes form part of these financial statements.

¹ Under a deed of transfer between the Academy and the Fund and for so long as ATSE is a member of the Fund, and the Fund has less than four members in total, it has been agreed that the Crawford shall:

- Maintain and audit its accounts in accordance with any requirements notified by ATSE's audit committee (to the extent such requirements are consistent with the law);
- Give ATSE access to inspect the accounting records and other documents of the Fund
- Establish an audit committee that includes the members of ATSE's audit committee, provided that the Fund has at least one director on that audit committee;
- Procure that CF Limited's auditor is the same as ATSE'S auditor; and
- Continue with the current insurances and reimburse ATSE for any costs incurred by ATSE in this regard.

Crawford Fund Limited ABN 86 141 714 490

STATEMENT OF FINANCIAL POSITION AS AT 30 JUNE 2011

	Note	2011 \$
ASSETS		
CURRENT ASSETS		
Cash and cash equivalents	4	456,187
Trade and other receivables	5	65,125
Other assets	6	53,359
TOTAL CURRENT ASSETS		574,671
NON-CURRENT ASSETS		
Property, plant and equipment	7	21,499
TOTAL NON-CURRENT ASSETS		21,499
TOTAL ASSETS		596,170
LIABILITIES		
CURRENT LIABILITIES		
Trade and other payables	8	102,047
Provisions	9	8,000
TOTAL CURRENT LIABILITIES		110,047
NON-CURRENT LIABILITIES		
Provisions		-
TOTAL NON-CURRENT LIABILITIES		-
TOTAL LIABILITIES		110,047
NET ASSETS		486,123
EQUITY		
Accumulated funds		486,123
Reserves		-
TOTAL EQUITY		486,123

The accompanying notes form part of these financial statements.

Crawford Fund Limited ABN 86 141 714 490

STATEMENT OF CHANGES IN EQUITY
FOR THE YEAR ENDED 30 JUNE 2011

	Accumulated Funds	Revaluation Surplus	Financial Assets Reserve	Total
	\$	\$	\$	\$
Balance at 01 July 2010	493,483	-	-	493,483
Comprehensive income				
Profit attributable to the entity	(7,360)	-	-	(7,360)
Other comprehensive income for the year	-	-	-	-
Total comprehensive income	(7,360)	-	-	(7,360)
Balance at 30 June 2011	486,123	-	-	486,123

Crawford Fund Limited ABN 86 141 714 490

STATEMENT OF CASH FLOWS FOR THE YEAR ENDED 30 JUNE 2011

	Note	2011 \$
CASH FLOW FROM OPERATING ACTIVITIES		
Receipt of grants		1,195,000
Other receipts		196,732
Payments to suppliers and employees		(1,483,167)
Interest received		49,948
Net cash generated from operating activities	12	(41,487)
CASH FLOW FROM INVESTING ACTIVITIES		
Funds transferred from Academy		511,013
Payment for property, plant and equipment		(13,339)
Net cash used in investing activities		497,674
CASH FLOW FROM FINANCING ACTIVITIES		
Repayment of finance lease liabilities		-
Net cash used in financing activities		-
Net increase/(decrease) in cash held		456,187
Cash and cash equivalents at beginning of the financial year		-
Cash and cash equivalents at the end of the financial year	4	456,187

The accompanying notes form part of these financial statements.


Crawford Fund Limited ABN 86 141 714 490

DIRECTORS' DECLARATION

The directors of the entity declare that:

1. The financial statements and notes, as set out on pages 6 to 19, are in accordance with the *Corporations Act 2001*:
 - a. comply with Australian Accounting Standards; and
 - b. give a true and fair view of the financial position as at 30 June 2011 and of the performance for the year ended on that date of the entity.
2. In the directors' opinion there are reasonable grounds to believe that the entity will be able to pay its debts as and when they become due and payable.

This declaration is made in accordance with a resolution of the Board of Directors.



John C Kerin (Director)

Dated this 4th day of August 2011

Crawford Fund Limited ABN 86 141 714 490

INDEPENDENT AUDITOR'S REPORT TO THE MEMBERS OF CRAWFORD FUND LIMITED**Report on the Financial Report**

We have audited the accompanying financial report of Crawford Fund Limited (the company), which comprises the statement of financial position as at 30 June 2011, the statement of comprehensive income, statement of changes in equity and statement of cash flows for the year then ended, notes comprising a summary of significant accounting policies and other explanatory information, and the directors' declaration.

Directors' Responsibility for the Financial Report

The directors of the company are responsible for the preparation of the financial report that gives a true and fair view in accordance with Australian Accounting Standards (including the Australian Accounting Interpretations) and the *Corporations Act 2001* and for such internal control as the directors determine is necessary to enable the preparation of the financial report that is free from material misstatement, whether due to fraud or error.

Auditor's Responsibility

Our responsibility is to express an opinion on the financial report based on our audit. We conducted our audit in accordance with Australian Auditing Standards. Those standards require that we comply with relevant ethical requirements relating to audit engagements and plan and perform the audit to obtain reasonable assurance whether the financial report is free from material misstatement.

An audit involves performing procedures to obtain audit evidence about the amounts and disclosures in the financial report. The procedures selected depend on the auditor's judgment, including the assessment of the risks of material misstatement of the financial report, whether due to fraud or error. In making those risk assessments, the auditor considers internal control relevant to the entity's preparation of the financial report that gives a true and fair view in order to design audit procedures that are appropriate in the circumstances, but not for the purpose of expressing an opinion on the effectiveness of the entity's internal control. An audit also includes evaluating the appropriateness of accounting policies used and the reasonableness of accounting estimates made by the directors, as well as evaluating the overall presentation of the financial report.

We believe that the audit evidence we have obtained is sufficient and appropriate to provide a basis for our audit opinion.

Independence

In conducting our audit, we have complied with the independence requirements of the *Corporations Act 2001*. We confirm that the Independence declaration required by the *Corporations Act 2001*, which has been given to the directors of Crawford Fund Limited, would be in the same terms if given to the directors as at the time of this auditor's report.

Opinion

In our opinion, the financial report of Crawford Fund Limited is in accordance with the *Corporations Act 2001*, including:

- (i) giving a true and fair view of the company's financial position as at 30 June 2011 and of its performance for the year ended on that date; and
- (ii) complying with Australian Accounting Standards and the *Corporations Regulations 2001*.

Auditor's signature:



Address: Level 3 Suite 29, 25 Claremont Street, South Yarra, VIC 3141

Dated this 4th day of August 2011

Crawford Fund Board and Committee Members and Staff

THE CRAWFORD FUND BOARD OF DIRECTORS

The Hon. John Kerin AM FTSE

Chairman of the Crawford Fund, former Minister for Primary Industries and Minister for Trade and Overseas Development

The Hon. John Anderson AO

Former Deputy Prime Minister and Leader of the National Party

Mrs Sallyanne Atkinson AO

Special Representative for Queensland Government in South East Asia

Dr Robin Batterham AO FREng FAA FTSE

President of the Australian Academy of Technological Sciences and Engineering

Dr Denis Blight AO FRSA

Executive Director of the Crawford Fund and former Director-General of CAB International

Mr Terry Enright

Former Chairman, Grains Research and Development Corporation

Professor Ross Garnaut AO FASSA

Professor at the Research School of Pacific and Asian Studies, Australian National University

Em Professor Helen Garnett PSM FTSE FAICD

Chair ABIN Board of Management

Dr Tony Gregson AM FTSE

Chairman of Plant Health Australia and former Board Chair, Bioversity International

Dr Margaret Hartley

CEO, Australian Academy of Technological Sciences and Engineering

Dr John Radcliffe AM FTSE

Former Deputy Chief Executive, CSIRO, and Director-General of Agriculture, South Australia

The Hon Margaret Reid AO

Former President of the Senate and Liberal Whip

Mr Michael Taylor AO FTSE

Former Chairman, Murray Darling Basin Authority

CENTRAL OFFICE

Dr Denis Blight AO FRSA

Executive Director

Dr Eric Craswell

Director Master Classes and Training

Ms Cathy Reade

Coordinator Public Awareness

Mr Philip Jackson

Financial Controller

Ms Marchien van Oostende

Executive Officer

STATE COMMITTEE MEMBERS

Victoria

Mr Royce Abbey AO DCM

World President Rotary International Rotary Club of Australia

Dr Rolf Beilharz

Retired Associate Professor - Animal breeding - University of Melbourne

Dr Alex Buchanan AM FTSE

Former Exec Director, The Crawford Fund

Mr Ben Dunlop

Vice President Credit Suisse

Mr Bob Edgar

Consultant Phillips Agribusiness

Dr Tony Gregson AM FTSE

Chair, Chairman of Plant Health Australia

Ms Magella Hamilton

British Consul General

Mr Ted Hayes FAIAST

Coordinator

Mrs Helena Hughes

Friend of the Crawford Fund

Mr Bruce Lloyd AM

Former Deputy Leader of National Party, Landcare consultant

Mr Christopher Pettit

Research Manager Spatial Information Science, Department of Primary Industries

Dr Peter Sale

Associate Professor and Reader - La Trobe University

Assoc Prof Paul Taylor

Associate Dean (International), The University of Melbourne

Dr Ron Wells

Veterinary Surgeon

Tasmania

Mr Geoff Dean	Coordinator
Dr Neville Mendham	Coordinator, Former Senior Lecturer in Agronomy
Mr Ian MacKinnon	Farmer, Former Chair, GRDC Southern Panel
Prof Holger Meinke	Director and Head of School
Ms Mel Rae	Consultant Macquarie Franklin
The Hon Paul Calvert AO	Deputy Chair, Governing Council of Old Government House, Former Senator
Mr David Addison	Farmer/ AUSVEG Board Member
Mr Bob Reid	Director, Tasmanian Global Seeds, Former Director of Agriculture, Falkland Islands
Prof Gustaaf Hallegraef	Chair, Education Committee, Institute for Marine and Antarctic
Prof Bob Menary	Professor of Horticultural Science School of Agricultural Science
Dr David Parsons	Research Fellow School of Agricultural Science, UTAS

Western Australia

Professor Lyn Abbott	Head of School of Earth and Geographical Sciences University of Western Australia
Mr John Carstairs	Friend of The Crawford Fund
Dr Terry Enright	Chair
Dr Mike Ewing	Future Farm CRC University of Western Australia
Em Prof Jen McComb FTSE	Coordinator
Dr Narelle Moore	Co-operative Bulk Handling Ltd
Dr T James Ridsdill-Smith FTSE	CSIRO Entomology
Mr Robert Sewell AM	Friend of the Crawford Fund
Mr John Allen	Dept Agriculture and Food WA
Dr Ian Duncan	Friend of The Crawford Fund
Prof John Edwards	Dean of the School of Biomedical and Veterinary Sciences, Murdoch University
Dr William Erskine	Director, CLIMA, UWA Institute of Agriculture
Dr Juliann Lloyd-Smith	Principal, Rural Research

Em Prof David Lindsay
Mr Mick McGinniss
Prof Kadambot Siddique
AM FTSE

Senior Honorary Research Fellow
Board Member Co-operative Bulk Handling
Director UWA Institute of Agriculture Faculty of Natural & Agricultural Sciences

Northern Territory

Prof Helen Garnett PSM ATSE FAICD	Chair, Previous Vice Chancellor CDU Crawford Fund Board of Management
Mr Neil MacDonald Ms Tania Paul	Regional Director & Manager of Pastoral Research Senior Lecturer, School of Science & Primary Industries, Charles Darwin University
Dr Jeremy Russell-Smith	Member North Australian Indigenous Land & Sea Management Alliance Tropical Savannas Management & Cooperative Research Centre Bushfires NT
Mr Richard (Dick) Slack-Smith	Coordinator, Former NT Assistant Director Fisheries R&D and Director Fisheries
Mr Tim West	NT Regional Landcare Facilitator

Queensland

Ms Sallyanne Atkinson AO Prof Kaye Basford	Chair, Honorary Consul for Brazil in Qld; Deputy President, Academic Board, School of Agriculture and Food Sciences
Dr Kep Coughlan	Coordinator, Former Director of Land Management Research, Queensland DPI
Prof Jonathan Hill Dr Richard Hodgson	Head, School of Veterinary Science Business Manager, Agricultural Genomics, Illumina Asia Pacific
Dr Denis Hoffmann Prof Bob Lawn	Private Consultant, Former Research Scientist CSIRO Foundation Prof of Tropical Crop Science, James Cook University
Mrs Janet Lawrence Dr Bruce Pengelly	Science Communicator IT & Communications Services Partnerships Leader, CSIRO-AusAID African Food Security Initiative, CSIRO Ecosystems Sciences

Dr George Rayment
Mrs Michelle Sinn

Dr Christine Williams

Mr Peter Wood

Friend of The Crawford Fund
Principal Coordinator (External Funding), Dept of
Employment, Economic Development and Innovation
Assistant Director General Environment and Resource
Sciences, DERM
Private Consultant

South Australia

The Hon Neil Andrew AO
Prof David Coventry
Mr Trevor Day
Ms Jane Greenslade
Dr Ann McNeill

Dr Kathy Ophel-Keller
Dr Ian Pitman
Dr John Radcliffe AM FTSE
Dr Albert Rovira AO FTSE
Dr Glen Weir

Dr Roger Wickes
PSM MAgSc FAIAST

Former speaker of the House of Representatives
Prof of Agronomy, The University of Adelaide
Farmer
Farmer
School of Earth & Environmental Sciences, The University of
Adelaide
SA Research & Development Institute
Former Innovation Director FH Faulding & Co Ltd
Chair, Former Deputy Chief Executive, CSIRO
Coordinator
Director Innovation Development Primary Industries &
Resources SA
Coordinator, Roger Wickes Project Services

Australian Capital Territory

Dr Joanne Daly
Dr Tony Fischer AO FTSE
Mr Tim Healy
Dr Jim Ryan
Prof John Lovett
Dr Peter McCawley

The Hon Margaret Reid

Group Executive, CSIRO Agribusiness
Visiting Scientist, CSIRO Division of Plant Industry
Consultant
Consultant
Chair, CRC of Plant Biosecurity
Visiting Fellow (Indonesia Project), Arndt-Corden
Department of Economics ANU College of Asia and the
Pacific
Chair, Former President of the Senate

New South Wales

The Hon John Anderson AO
Mr Dick Austen AO

Hon Prof Lester Burgess
Mr Neil Inall AM
Dr Helen Scott-Orr PSM

Dr Bruce Standen

Em Prof Graham Swain AM
Mr Bob Whan AM
Dr John Christian
Mr George Davey

Chair, Former Deputy Prime Minister and Leader of the
National Party
Cattle Producer, Former Chair of the Australian Meat and
Livestock Corporation
Former Dean of Agricultural Science, University of Sydney
Agricultural Commentator
Former Director of Health Sciences, Strategic Alliances and
Evaluation, NSW Department of Primary Industries.
Coordinator, Former Managing Director Australian Meat
and Livestock Corporation
Former Dean, University of Western Sydney
Former Member of Parliament and Agricultural Scientist
Former Chief, CSIRO Division of Food Technology
Deputy Director General NSW DPI

BOARD MEMBERS (OTHER THAN COMMITTEE MEMBERS)

Prof Robin Batterham
AO FREng FAA FTSE

Dr Margaret Hartley
Prof Ross Garnaut
The Hon John Kerin AM FTSE

President ATSE

Chief Executive Officer, ATSE
Professor, Research School of Pacific and Asian Studies
Chair

Acronyms

AAHL	Australian Animal Health Laboratory
ABC	Australian Broadcasting Corporation
ACIAR	Australian Centre for International Agricultural Research
ATSE	Academy of Technological Sciences and Engineering
AWiA	Australian Women in Agriculture
AYAD	Australian Youth Ambassadors for Development
AusAID	Australian Agency for International Development
CCAFS	(CGIAR Research Program on) Climate Change, Agriculture and Food Security
CCN	cereal cyst nematode
CEO	chief executive officer
CGIAR	Consultative Group on International Agricultural Research
CIE	Centre for International Economics
CSIRO	Commonwealth Scientific and Industrial Research Organisation
CIMMYT	International Maize and Wheat Improvement Center
CVL	Central Veterinary Laboratory (Nepal)
DNA	deoxyribonucleic acid
HLB	huanglongbing (citrus greening disease)
ICARDA	International Center for Agricultural Research in the Dry Areas
ICRISAT	International Crop Research Institute for the Semi-Arid Tropics
IFAD	International Fund for Agricultural Development
IFPRI	International Food Policy Research Institute
NARI	National Agricultural Research Institute (Papua New Guinea)
NGO	nongovernmental organisation
PNGOPRA	Papua New Guinea Oil Palm Research Association
PNGWiADF	Papua New Guinea Women in Agriculture Development Foundation
R&D	research and development
RDRS	Rangpur Dinajpur Rural Service (Bangladesh)
RVL	Regional Veterinary Laboratory (Nepal)
RVPL	Rabies Vaccine Production Laboratory (Nepal)
WACCI	West African Centre for Crop Improvement

ABN 86 141 714 490

Published by The Crawford Fund

Annual Report Management: Cathy Reade

Editing, design and layout: Green Ink
(www.greenink.co.uk), in association
with Jeff Walker and Sadie Moisan.

Printing: Union Offset Printers

Cover Photo: Sven Torfinn/Panos Pictures

Unless credited otherwise, photos in this
publication have been provided by our
trainers, trainees or stakeholders with
permission.

Distribution

This report is available through the Crawford
Fund website (www.crawfordfund.org) or by
contacting our office.



THE CRAWFORD FUND

For a Food Secure World

Contacts

One Geils Court

Deakin

ACT 2600

Australia

Phone: +61 (2) 6285 8308

Email: crawford@crawfordfund.org

Web: www.crawfordfund.org