

THE CRAWFORD FUND

KNOWLEDGE FOR A FOOD SECURE WORLD

OVERVIEW 2012-16



2017 AND BEYOND



ANNUAL REPORT 2015-16



THE CRAWFORD FUND

For a Food Secure World



ABOUT US

What is the Crawford Fund?

The Crawford Fund is a not-for-profit organisation that seeks to increase Australia's engagement in international agricultural research and development through raising awareness of the benefits to Australia and the developing countries from investment in the sector and through training programs for developing country scientists that draw on Australian experience.

We are a registered charity and depend on grants and donations from governments, private companies, corporations, charitable trusts and individuals. We work in partnership with the Australian Centre for International Agricultural Research (ACIAR), the Consultative Group on International Agricultural Research (CGIAR) research centres, and other international research organisations.

What are our aims?

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, and by encouraging investment by governments and the private sector in agricultural research and its applications.

What do we do?

Our public awareness program improves 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. We encourage and support young Australians in their careers, studies and volunteering in agriculture for development; and we develop policy and discussion papers to increase understanding of food security issues.

Our partners and beneficiaries 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.

ATSE and the Fund

The Crawford Fund was established in 1987 as an initiative of the Australian Academy of Technological Sciences and Engineering (ATSE). At ATSE's suggestion, the Fund became a separate not-for-profit company in 2014 with ATSE as the sole member, and our board members were appointed as Directors of the Fund. ATSE and the Fund maintain close links: ATSE nominates a member on our Board; and the Fund is involved in the ATSE Agriculture Forum, including through assistance for its *Agribusiness 2030* event held in 2016 (see page 15).

ABOUT SIR JOHN CRAWFORD

The Crawford Fund honours the life of Sir John Crawford, a remarkable Australian who supported international agricultural research for rural development and contributed to the establishment of the CGIAR and its research centres. Along with Mr James Ingram AO and the Hon. Malcolm Fraser, Sir John was one of the principal architects of ACIAR.

Born in Sydney in 1910, he began his role in public service during the Second World War and became Director of Research at the Department of Post-War Reconstruction in 1943. Following the war, he was appointed Director of the Bureau of Agricultural Economics, 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 UK and Japan, and helped construct an Asia-Pacific economic and policy community.

In 1960 Sir John joined the Australian National University (ANU) as the inaugural Director of the Research School of Pacific Studies; he later served as Vice-Chancellor and Chancellor. In the 1970s he was instrumental in setting up the Australian Government's international aid agency. The Fund has commissioned a biography of Sir John to be published in 2018 (see page 7).





Supporting agriculture is one of the most effective ways for Australia to contribute to the environment, economy and people, globally and locally

CONTENTS

- From two chairs, past and present ii**
- Overview 2012-16..... 1**
 - Evolution and consistency..... 1
 - Long-term commitments3
 - Working in partnership4
 - A financially robust Fund6
- Looking forward - 2017 and beyond 8**
 - Public awareness8
 - Policy options8
 - Master Classes8
 - State and Territory training.....8
 - Mentoring9
- Annual report 2015-16.....10**
 - Public awareness program10
 - Harnessing youthful enthusiasm19
 - Master Class and training program.....22
- Financial report30**
- Crawford Fund Board, Staff and Committees 2015-16.....32**
- Acronyms36**
- Contacts.....36**





FROM TWO CHAIRS, PAST AND PRESENT



By the time the audit and technical formalities associated with the publication of an annual report are complete, much of the narrative for any given year has been overtaken by events, such is the pace of change in food security and in international agricultural research. So, while this report is about Crawford Fund activities in the financial year 2015-16, we have taken the liberty of adding to developments within that 12-month period by extending its coverage into the latter months of the calendar year 2016. And to give a meaningful context to this year's events, we have looked back at developments in the past and taken a sneak peek at activities on our future agenda. We hope you will indulge us this 'extension' and find it helps to better explain the variety and impact of our work.

As one of us (John Kerin) completed his five-year term as Chair of the Board of Directors in December 2016, and the other (John Anderson) took up the post in January 2017, we decided that in the same spirit of context and continuity we would write a joint introduction to this review and annual report.




We both think that a joint introduction serves another purpose: it underpins the enduring bipartisan support enjoyed in Australia for investment in international agricultural research, and in the resonating phrase coined by Professor Derek Tribe over 25 years ago – “doing well by doing good”. Further proof of this bipartisan support is demonstrated by sustained support for ACIAR. Established in 1982 by a Coalition Government led by Malcolm Fraser, with backing from the Labor Party, the Centre grew under the Hawke-Keating and Howard Governments; was fostered by the Rudd-Gillard Government;

and has been prominent in the aid program of more recent administrations. ACIAR has been described by the Hon Julie Bishop, Deputy Leader of the Liberal Party, as “the jewel in the Australian aid program”.

We couldn't agree more, and long may this support continue. We are confident that it will do so if the evidence base for the beneficial impact of investment in research, development and training – for the developing countries and for Australia – is studied and understood. Both ACIAR, through its outstanding and independently verified Impact Assessment Series;¹ and the Crawford Fund, through its high-level task force reviews of 2008² and 2013,³ have documented this strong evidence base.

To this more evidence-based proof of benefit we can add all the voices of the Fund's own Australian scholars and awardees, who invigorate us with their energy and passion for agriculture at home and abroad. We are both particularly proud of the Fund's move to further engender this interest in young Australians and to support their opportunities for studies, careers and volunteering in this important and beneficial area of activity.

The Crawford Fund's public awareness program (pages 10-18) has added to this rich platform through its events and media activities, and especially through the content and delivery of our annual conferences (page 10), which each year address a different topic reflecting contemporary food security issues and policy questions.

1 <http://aciar.gov.au/publication/term/25> 
2 www.crawfordfund.org/focus/food-security-task-force-2008/ 
3 www.crawfordfund.org/focus/doing-well-by-doing-good/ 

This look back at our capacity building program summarises training and mentoring activities offered over recent years and into the future. We have held Master Classes on a wide variety of topics, from soilborne pathogens to communications (page 22), and a review of the Master Classes program was carried out in 2015 (page 1). Our overview of State and Territory training (page 23) also highlights programs that have extended over a long period, illustrating the importance of continuing mentoring and long-term support for training and capacity building.

This report demonstrates the Fund's attention to ensuring its robustness and growing partnerships to sustain itself in times of fiscal constraint. The summary financial data and audited accounts for the financial year 2015-16 are included here (pages 30-31), and full statements are available online.

Finally, we wish to record our thanks to Dr Denis Blight AO FRSA, the Fund's Chief Executive, for his dedication and reforming zeal over the ten years of his appointment at the Fund and after a career as an Australian diplomat, an aid administrator, and in international education and international agricultural research.

We commend this report to you and encourage you to engage with us in our efforts at doing well by doing good.



John Kerin



John Anderson



OVERVIEW 2012-16

Evolution and consistency

During this five-year period the Crawford Fund has evolved and changed, but in ways that reflect a consistency of mission and purpose in changing times and fiscal circumstances.

Our annual conferences hold a key place in the development and food security calendar in Australia. Since 1993 we have successfully brought into sharp focus issues worthy of global and Australian attention. Each year the topic selected for detailed scrutiny by the world's best speakers has shifted as new areas for research and development become prominent on international and Australian agendas. All show that there is no single, simple solution to global food security, but research and development interventions can address issues and challenges in the search for a food secure world, and these interventions are beneficial to Australia as well as the developing world (see Box on page 2).

Our public awareness activities have evolved over the past five years as we have explored new ways of increasing Australia's interest and engagement in international agricultural research. We've had more State based events, have seized opportunities to assist others with their food security events, and have worked closely with international visitors to raise awareness of food security issues. We introduced a new conference scholars program to enable young scientists to attend our annual conferences (see page 19). And our 'Seeing is believing' program (see page 16) has supported journalists' visits to agricultural research projects in over 14 countries, including Burundi, Cambodia, Indonesia,

The Derek Tribe Award

This biennial award, jointly sponsored by the Fund along with a private philanthropist, goes to citizens of developing countries in recognition of their contributions to research in agriculture or natural resource management. We were delighted to learn that Dr Sanjaya Rajaram, who received the first Derek Tribe Award in 2001, was awarded the World Food Prize in 2014.

2013

Dr Murom Banabas, Head of Agronomy at the Papua New Guinea Oil Palm Research Association, received the 2013 Award in recognition of 22 years' research and technical assistance dedicated to improving the sustainability and productivity of the oil palm industry.

2015

The Award was presented to Dr R. K. Malik, Senior Agronomist with the Sustainable Intensification Program of the International Maize and Wheat Improvement Center (CIMMYT), based in Bihar, India.



Dr Malik receiving the Award from Dr Denis Blight AO and the Hon. Margaret Reid AO

Lao PDR, Mexico, Peru, the Philippines, Taiwan, Tajikistan, Tanzania, Timor-Leste, Solomon Islands, Thailand and Vietnam. We also launched our Food Security Journalism Award in 2013, in partnership with the Australian Council of Agricultural Journalists (see page 17).

The Fund's Master Classes have followed a similar pattern of change, with new topics introduced that reflect

emerging priorities, and older topics revisited from new perspectives and with new trainers. In 2015 we finalised a *Review of Master Classes and Training Activities*.⁴ Over the next few years we will aim to provide our high-quality Master Classes in four areas prioritised by the review:

⁴ www.crawfordfund.org/wp-content/uploads/2015/07/Master-Classes-and-training-Review-2015.pdf



Hot topics – five years of annual conferences

2012

The scramble for natural resources: more food less land.

In his Sir John Crawford Memorial Address at our 2012 conference, Sir John Beddington, Chief Scientific Adviser in the UK, said that by 2025 a more urbanised world will need to house an expanded population with new patterns of demand for food and energy. The conference speakers then showed how investment in governance and science can address major distribution and degradation problems in land and water to produce more food per hectare. New investment in community- and technology-based communication is giving a practical boost to small farmers' knowledge and management of their crops in developing countries.

2013

Mining, agriculture and development. Bread from stones?

Held jointly with the Africa Australia Research Forum in Perth, Western Australia, this conference was a first step towards synergy between agriculture and mining for development – both of which are economic drivers in Africa and elsewhere. In her Sir John Crawford Memorial Address, Hon. Dr Florence Chenoweth, Minister for Agriculture in Liberia, called for increased investment in African agriculture. Conference sessions focused on possible corporate

social responsibility in investments by mining companies, and cooperation between miners and agriculturalists – for example by supplying mines with locally produced food.

2014

Ethics, efficiency and food security: feeding the 9 billion, well.

The pivotal role of women resonated throughout this conference, and in her Sir John Crawford Memorial Address, Professor Catherine Bertini from the Chicago Council on Global Affairs highlighted the benefits of investing in women. The one-day conference focused on the need to increase global food production in ways that are ethical, efficient, and profitable for farmers, consumers and the environment. Issues covered included population control; strong supply chains; value-adding via food processing; and access to market data.

2015

The business of food security: profitability, sustainability and risk.

The 2015 Sir John Crawford Memorial Address, *Facing the uncomfortable challenge of food security*, was given by Dr Cary Fowler, who oversaw the development of the Svalbard Seed Vault (see page 17). Partnership and collaboration was a dominant theme at the one-day conference: multi-level partnerships

can cross national, regional and sociopolitical boundaries, as for example when international research centres work with seed companies to distribute seed to farmers. Initiatives emerging from such partnerships can be disseminated widely via commercial channels.

2016

Waste not, want not: the circular economy to food security.

Professor Louise Fresco of Wageningen University delivered the Sir John Crawford Memorial Address on the future of food. The conference explored post-harvest losses on smallholdings in developing countries; the discarding of edible foodstuffs in the developed world; and conversion of waste streams into sources of nutrients, aquafeed and energy. The role of supermarkets and private sector investment, which can be highly influential in reducing loss and waste, brought additional dimensions to investment by the public sector.

I've come out of this meeting with a renewed sense of optimism, seeing evidence of a breakdown of the old dichotomies between agriculture and the environment."

Professor Jon Foley, keynote speaker at 2012 conference, now executive director of the California Academy of Sciences



biosecurity and market access; water and soil management for sustainable intensification of agriculture; research management training; and innovative systems and platforms including information and communication technologies. Since 2015 approximately 50% of funding for the majority of classes has been recovered from sponsors and via participation fees; we are now working to a new co-financing model, and we are attracting new sources of support for the program. There are too many to list in this report – a full list of Master Classes held from 2012 to 2016 is available at www.crawfordfund.org/wp-content/uploads/2017/05/Master-Classes-Since-2011.pdf, and highlights for 2015–16 are showcased on pages 22–23.

Our State and Territory Committees sponsor training and mentoring activities in response to concepts submitted by the broader Crawford Fund network. Quite often these are *ad hoc* in nature, filling gaps not being met by larger programs, or supplementing larger projects commissioned by ACIAR. We aim to identify training that both responds to the needs of developing country scientists and reflects areas of interest identified by organisations that approach us for support. A few examples follow and the full list of training activities 2012–2016 can be viewed at www.crawfordfund.org/wp-content/uploads/2017/05/P-23-Overview.pdf. For 2015–16 training highlights, see pages 23–29.

Long-term commitments

State and Territory training highlights 2012–16

Pest management and biosecurity in Lao PDR

Professor Lester Burgess, supported over the past five years by the New South Wales Committee, with other State and Territory Committees assisting on occasion, has effectively established a plant biosecurity system for southern Lao PDR, making use of clustered Australian Volunteers for International Development (AVID) workers. This successful approach is set to serve as a model for future mentoring activities (see page 9).

In the past five years the Fund has provided training for individuals from 52 countries



Rabies management in Bhutan, Indonesia and Nepal

Since 2003 our Victorian Committee has been providing support for training by the Australian Animal Health Laboratory (AAHL) on the control of rabies in Bhutan, Indonesia and Nepal. The work was initiated after a visit to Australia by the late Dr Ganesh Pant of Nepal's Rabies Vaccine Production Laboratory, initially to improve the knowledge base for Japanese encephalitis. This led to the development of an improved, simpler and cost-effective rabies test for resource-limited laboratories – the Rabies Immunoperoxidase Antigen Detection (RIAD) test. This new, simple, low-cost test has improved the accuracy of initial rabies testing and thus saved lives. Along with AAHL, the Fund has supported training workshops in Nepal and Indonesia; improvements to the rabies vaccine production and quality control processes; and a technical visit and subsequent report to Nepal by John Allen of AAHL to assist in planning the country's rabies control programs. There is now potential for expanding RIAD to Chad and other sub-Saharan African countries with endemic rabies.

Rice production in north-west Cambodia

Our New South Wales Committee has also sponsored training in rice production in partnership with the University of Sydney and the Syngenta Foundation for Sustainable Agriculture (SFSA). In March 2016 the Committee funded a visit by Professor Yorn Try of Mean Chey University. Working cooperatively with Professors Peter Sharp and Bill Rathmell of the University of Sydney, as well as staff of the New South Wales Department of Primary Industries, Try visited a range of irrigated and intensive agricultural systems in New South Wales, and attended a SunRice extension field day near Leeton and a roundtable discussion at ACIAR in Canberra. From this visit emerged the proposal for a Master Class on

leadership in rice production, which was delivered in late 2016 in north-west Cambodia with funding and in-kind support from the Fund, University of Sydney, SFSA and Mean Chey University. It feeds into an ACIAR/University of Sydney project led by Dr Daniel Tan, and there are already spin-off courses being delivered in Cambodia by an independent NGO.

Working in partnership

In addition to the training supported by our State and Territory Committees, we also have partnership projects to support capacity building activities, and a few selected examples are briefly described below.

The project *Demand-led plant variety design for emerging markets in Africa*⁵ is sponsored by an alliance between the Crawford Fund, ACIAR and the SFSA (see page 9). It has attracted funding of \$600,000⁶, with equal contributions by ACIAR and SFSA, and the Fund contributing \$100,000. It has led to a new curriculum for training plant breeders throughout Africa which draws on best practice in the private and public sectors.

Our *Australia-Africa Plant Biosecurity Partnership*⁷ with ACIAR, the Plant Biosecurity Cooperative Research Centre (PBCRC) and the Centre for Agriculture and Biosciences International (CABI) builds biosecurity capacity in Eastern and Southern Africa (see Box on page 5). The Fund's main role, following our competitive tender for the ACIAR contract when forming this strategic alliance, is through our Chief Executive's membership of its steering committee, and in providing 'soft skills' training.

5 <http://aciarc.gov.au/aifsc/projects/demand-led-plant-variety-design-emerging-markets-africa> 

6 This report uses Australian dollars (A\$) throughout.

7 www.pbcrc.com.au/research/east-africa 



Working on the RIAD test for early diagnosis of rabies

Our *Rice seeders for Laotian farmers* initiative is led by Dr Leigh Vial, formerly with the International Rice Research Institute (IRRI) and a farmer in the Riverina in New South Wales. We worked with Dr Vial to raise some \$30,000 to purchase rice seeders for Laotian farmers and to provide training in their use. Our deductible gift-recipient status was important in the fundraising effort. At the end of 2016 we celebrated the news that



Australia–Africa Plant Biosecurity Partnership

The Fund is a partner in the Australia–Africa Plant Biosecurity Partnership – a capacity development program that uses Australian expertise to strengthen biosecurity skills and planning in Africa. The project aims to develop a network of biosecurity champions who will support increased production, market access for African farmers and improved food security.

The Partnership is being delivered by a consortium of PBCRC, ACIAR, the Crawford Fund and CABI. A video introducing the project can be viewed on PBCRC's website.⁸

The project has identified 'soft skills' as a key area of training needed to complement the technical training planned for the biosecurity champions, to enable them to promote and advocate the value



'The Australia–Africa Plant Biosecurity Partnership' by PBCRC

⁸ <https://vimeo.com/165240031>



Crawford Fund biosecurity champions

of plant biosecurity to industry, government and other senior public officials to improve the profile and funding for plant biosecurity in Africa. This is putting the Fund's relevant expertise – and our Master Class on *Communicating with stakeholders* – to good use. In addition to ongoing involvement in the program's steering committee, we are delivering training for the biosecurity champions, who are senior and associate fellows from national plant protection organisations and private sector agricultural organisations in Burundi, Ethiopia, Kenya, Malawi, Mozambique, Rwanda, Tanzania, Uganda, Zambia and Zimbabwe.

The first training activities were held in Nairobi in August 2015, with the assistance of Econnect Communications, prior to placements of senior fellows in Australian plant pest and disease agencies later in the year. At the end of their Australian placements, further soft skills training was provided in Perth.

A final project workshop, held in Lusaka in February/March 2017, identified the significant progress this capacity building project has made in strengthening biosecurity systems in participating countries. Achievements include a dramatic fall in post-harvest losses in mango production in Tanzania, attributed to lessons gained during training in Australia.

This training has provided our biosecurity champions with the opportunity to develop a communication and action plan, and to learn various communication techniques and skills, including hands-on experience of blogging, speaking to the media, action planning and networking, to share their new-found expertise with colleagues and teams in their home countries.

In 2016 the Fund's Director, Dr Denis Blight AO, continued our involvement through the steering committee and attendance at workshops. By the end of 2016, all fellows had implemented some form of public awareness program with their executive, inspectors, farmers' groups and the private sector.



the effort had secured funding for ten four-row, direct-hitch, multi-crop seeders, due to arrive in Lao PDR in March 2017.

A financially robust Crawford Fund

Over this five-year period we have enjoyed financial support from Federal and State governments as well as a number of smaller donors. Our annual grant from the Australian Government has fluctuated around \$1 million dollars.

Most State and Territory Governments have also made welcome contributions. And we enjoy in-kind support from a broad group of organisations, institutions and individuals to whom we are very grateful.

The Board is building a robust Crawford Fund by attracting new sponsors and donors and through self-funding activities. Our deductible gift recipient status was granted in August 2012 and partnerships

with the corporate and philanthropic sectors are growing steadily. This report tabulates summary financial accounts over the period. The 2015–16 financial statement is summarised on pages 30–31; the full report can be found on our website.⁹

As several observers point out,¹⁰ the changing global landscape for agriculture has been particularly evident in the past five years. Public sector spending on agricultural research and development is in relative decline and is being overtaken by private sector spending.

Economic crises and fiscal austerity policy responses have not only reduced funding for the public sector generally, but have targeted relatively soft allocations such as research and development assistance.

We cannot expect to be immune from such pressures in terms of both our own funding and our ambition to increase wider investment in international agricultural

research. While we draw comfort from the fact that funding for ACIAR has fallen at a lower rate than aid funding generally, we understand that the trends point to a need to encourage the wider international agricultural research system to broaden its funding base, and to seek new compatible revenue streams for our own activities.

In 2009 the Fund's annual conference was on the topic *Can private sector R&D feed the poor?* The answer is yes, no, and maybe. Over the years, the international agricultural research system has struggled to engage with the private sector in a way that meets their overlapping but different interests, finds common ground in technology practice, and aligns with services to farmers.

Enterprise and imagination are needed – as, for example, in our collaborative partnership on demand-led plant breeding (see Box on page 9).

⁹ www.crawfordfund.org/wp-content/uploads/2017/03/Crawford-Fund-Financials-2016-signed-31-Aug-2016.pdf 

¹⁰ e.g. Kropff, M. (2015) 'Integrating public and private sector research goals for sustainable food security', presented at *The business of food security: profitability, sustainability and risk*, Crawford Fund Annual Conference, August 2015. www.crawfordfund.org/events/2015-conference/speakers/2015-conference-martin-kropff/ 

Inspiration from the past

With co-funding from the Australian Department of Foreign Affairs and Trade (DFAT) and the Australian Research Council, the Fund is helping to write a comprehensive biography of Sir John Crawford. The project is headed by Professor Nicholas Brown, Head of School, ANU College of Arts & Social Sciences. The Australia-based archival research for the biography is now largely complete, complemented by work in the World Bank and Rockefeller Archives. Aspects of the project have been presented in seminars and conference papers over the past two years, including a full panel at the Australian Historical Association's annual conference in July 2016.

Sir John Crawford is widely regarded as one of the architects of the so-called Green Revolution that averted the spectre of global starvation and misery predicted by Malthus, the Club of Rome and others. He is seen as the founder of the Consultative Group for International Agricultural Research (CGIAR). The group of international agricultural research centres under the CGIAR umbrella – and some outside it, such as the International Fertilizer Development Center, the Asian Vegetable Research and Development Center (AVRDC, now the World Vegetable Center) and CABI – led a global effort to introduce new, higher-yielding varieties of grains and livestock to farming systems in the developing world. Sir John



Sir John with former Australian Prime Minister Gough Whitlam and Mrs Indira Gandhi. Sir John had encouraged Mr Whitlam to pay an early visit to India during his Prime Ministership.

was the first Chairman of CGIAR's Technical Advisory Committee, which was crucial in enhancing governments' confidence in the work of the international agricultural research system to enable a significant expansion in funding and support for the CGIAR and related centres. He was pivotal in persuading the Australian Government to establish ACIAR, and led the establishment of the International Livestock Centre for Africa (whose work is continued by the International Livestock Research Institute, ILRI) and the International Food Policy Research Institute (IFPRI).

It is remarkable that Sir John could contribute to this global endeavour at the same time as he was involved in a range of other critical global, regional and national issues in fields such as trade, industry assistance and structural changes in the Australian economy. His work in the CGIAR, which reflected a lifetime commitment to human advancement, continued well beyond his retirement from full-time employment and up to his untimely death at the age of 74. He was one of Australia's most significant public servants, public intellectuals and policy advisers of the 20th century. It is, we feel, appropriate that his contribution to global food security should be examined in the broader context of global and national economic development.

The Fund's Chief Executive, Dr Denis Blight AO, who has been closely associated with the project (and in the past with Sir John), will spend a semester in 2017 as a visitor at ANU to oversee completion of the biography. This comprehensive analysis of Sir John's life and times, and of lessons we can learn from his approach to policy and practice, has clear applications to modern times as today's policy-makers face challenges that include the impacts of climate change and globalised food production.



LOOKING FORWARD - 2017 AND BEYOND

We have built a sound foundation for the Fund's future. Over the next five years our initiatives will be targeted at public awareness; policy options; Master Classes and State and Territory training; and encouraging young Australians in agriculture.

Public awareness

The 2017 annual conference will be held on 7-8 August, during a Parliamentary sitting week, and is titled *Transforming lives and livelihoods – the digital revolution in agriculture*. It will focus on current and future impact of the data revolution for smallholder farmers.

We will continue to hold or co-host events around Australia demonstrating the positive impacts of agricultural research and training. We hope our conference scholars, and members of the Researchers in Agriculture for International Development (RAID) network (see page 19), will play a central role in these promotions, demonstrating the exciting potential of the next generation of Australian agricultural researchers and farmers to improve productivity in Australia and globally. Early events are planned for Queensland, New South Wales and Tasmania in the first half of 2017.

The Fund's public awareness program has undoubtedly helped to raise awareness and to sustain Australian aid and other funding for international agricultural research. Our Master Class on *Communicating with stakeholders*, which has been held in Australia, Ethiopia, Fiji, India, Nairobi and Thailand, brings together our communication and training arms to strengthen communication

skills within developing country agricultural research agencies.

Policy options

We will continue to encourage discussion of policy options for improving global food security. The Fund recognises that there is no single, simple pathway to a food-secure world, and emphasises the importance of continued investment in international agricultural research and training.

We welcome ACIAR's support for the Crawford Fund. We add value to ACIAR's programs through our public awareness, Master Classes and training activities, and will continue in our role as 'a critical friend'.

We are engaging in a small number of pilot programs in areas that seek to extend the boundaries of investment options in international agricultural research. These include our joint work with ACIAR and the SFSA on the theme of demand-led research (see Box on page 9); and the Australia-Africa Plant Biosecurity Partnership (page 5).

The Fund is also considering commissioning another special task force in 2017 which will coincide with the appointments of our new Chair, The Hon. John Anderson, from 1 January 2017 and our new Chief Executive, Dr Colin Chartres, from 1 July 2017.

Master Classes

In 2016 the Fund ran highly successful Master Classes in research leadership and management (page 23), and in

information management of genetic resource collections (page 22). Both classes attracted significant external support. We intend to offer these classes on an on-going basis. Informed by discussions with Australian commodity exporters we are planning a new Master Class in biosecurity and market access. The demand-led research partnership (see Box on page 9) will also generate Master Classes conducted by African expats. We will continue to offer our Master Class on communicating with stakeholders, which has also attracted external funds, and on agribusiness in Asia, aimed at both emerging agricultural researchers in Australia and scientists from the national agricultural research systems in developing countries.

The development and administration of finely targeted Master Classes require substantial professional inputs and brokerage skills, not dissimilar to those used in development of research project partnerships. The Fund has appointed honorary individual and institutional champions to lead the development, delivery and administration of Master Classes, and we intend to pursue this approach as far as possible while balancing the sometimes differing, albeit complementary, objectives of developed and developing country institutions and sponsoring agencies and companies.

State and Territory training

A feature of the Crawford Fund's devolved corporate structure, our State and Territory training programs are co-sponsored by the Fund together with State/Territory governments, and supported by Australian research and training institutions on an in-kind basis. As we seek



to increase our contribution to building capacity in developing countries as well as meeting the interests of Australian and international sponsors, we will look to a greater measure of cooperation and cohesion among the different elements of the programs, and an even closer alignment with ACIAR. We will make increasing efforts to link State-based training to ACIAR programs and to keep overseas-based ACIAR managers aware of opportunities and benefits for their respective jurisdictions.

Growth in the State and Territory programs will depend on our success in sustaining financial support from State governments; attracting a minimal level of funding from the two Territory governments; and building new partnerships in the private, not-for-profit, research and training, and philanthropic sectors.

Mentoring

Where priorities between jurisdictions, institutions and sponsors overlap, efficiencies are gained through cooperation. One option being actively explored is the appointment of senior Australian research and training mentors drawn from Australian institutions, based on the successful model operating in Lao PDR under the guidance of senior mentor Professor Lester Burgess, formerly Dean of Agriculture at the University of Sydney. A case study of the AVID program in Lao PDR¹¹ praised the approach of clustering volunteers in the agricultural science sector with the mentoring support of Professor Burgess, with enhanced impact on the capacity of local research administration and extension services, as

Building a new alliance

In June 2014, The Hon. Julie Bishop, Minister for Foreign Affairs, launched the first project of the Alliance for Agricultural R&D for Food Security:¹² *Demand-led plant variety design for emerging markets in Africa*. The Alliance brings together ACIAR's Australian International Food Security Research Centre, the SFSA and the Crawford Fund, and is administered by The University of Queensland's Global Change Institute.

The project addresses the conundrum of low adoption of new plant varieties for many food security crops in sub-Saharan Africa. It aims to identify the best African and international expertise and practices in modern variety design, from both private and public sectors, and disseminate these best practices widely in Africa.

As well as developing more high-performing varieties that meet customer requirements and market demand, the project is building capacity on demand-led variety design within plant breeding programs in

Africa, and providing evidence to support new policy development and investment in plant breeding.

Through 2015–16 the project has been carrying out two case studies on best practices in demand-led plant breeding – on beans and chickpeas. New approaches to variety design are also being tested on tomato in Ghana and beans in Rwanda.

The project has organised a Pan-African expert group of plant breeding educators from the leading training institutions across Africa to create an innovative curriculum module on demand-led plant variety design. The module is designed with multiple users in mind, from postgraduate students and experienced breeders through to research and development managers and policy-makers. The first courses, for postgraduates and continuing professional development of breeders, began in December 2015 and will continue through 2016–17. The curriculum, largely written by African research leaders and higher educators, is to be published by CABI in 2017.

¹² <http://aciarc.gov.au/aifsc/new-alliance-drives-innovation-african-food-security> 

well as on the volunteers' own training. The Fund's State and Territory Committees have been invited to emulate this approach by identifying a set of senior

mentors for their target countries, which may include Cambodia, Indonesia, Myanmar, Timor-Leste and the Island States of the South Pacific.

¹¹ www.scopeglobal.com/volunteers-for-food-security-in-laos/ 

ANNUAL REPORT 2015-16

Public awareness program

Central to the public awareness program's diverse strategy is the Fund's mission to raise awareness among Australian decision-makers and the public about the positive impact of international agricultural research on food and nutrition security, both nationally and internationally.

Connecting through public events

Annual conference

Our annual conference, with the Sir John Crawford Memorial Address and dinner followed by our one-day Parliamentary Conference, draws capacity attendance each year. While food security is always the focus, the issues are diverse and our speakers are first class. We aim to attract widespread media coverage¹³ and a real buzz with social media, for example with young



'Interviews and ideas' by Western Sydney University

¹³ www.crawfordfund.org/wp-content/uploads/2016/09/MEDIA-REPORT.pdf

delegates at the 2015 and 2016 conference videoing attendees and speakers on food security.¹⁴

2015

The business of food security: profitability, sustainability and risk focused national attention on the importance of collaboration between public and private sectors to achieve sustainable intensification and improved food security. Speakers included Mr Chris Brett, Senior Vice President, Head of Corporate Responsibility and Sustainability, Olam International; Mr Anthony Pratt, Chairman and CEO of Pratt Industries; and Her Excellency Gerda Verburg, Chair of the Committee on World Food Security and of the World Economic Forum Global Agenda Council on Food and Nutrition Security.

2016

Waste not, want not: the circular economy to food security covered production, post-production, processing, distribution and consumption, with particular regard to the management and re-use of waste.

For the first time in 2016, in addition to our traditional keynote presentations from the public and private sectors, we incorporated overviews presenting a range of case studies on innovative projects achieving real impact. The new format received a very positive response. Our keynote speakers were Dr Karen Brooks, Director, CGIAR Research Program on Policies, Institutions and

¹⁴ www.youtube.com/watch?v=ZbjSnhoiOJU

Markets, and Mr Daniel Lager, Executive Director of Technical and Production, Nestlé Oceania.



Mr Daniel Lager presenting the afternoon keynote in 2016

In 2016 we added an invitation-only reception at Parliament House, co-hosted by ACIAR and DFAT, in place of the Parliamentary Breakfast. It included a talk by the Sir John Crawford Memorial Address presenter, Professor Louise Fresco. The event coincided with the opening of both Houses of Parliament, and we were very pleased to receive a special message from the Hon. Julie Bishop, Minister for Foreign Affairs, and to host a number of returning and new members of Parliament at the reception.

Our regular feedback surveys show that the annual conferences prompt discourse, networking, engagement and mentoring between young and old, as well as action in terms of global food security. Conference proceedings are available at www.crawfordfund.org/events.

Thanks

We are grateful to our conference organising committee members, including those from ACIAR and DFAT. Our annual event would not be possible without the tremendous support of sponsors and supporters, including our long-term sponsors:

- Grains Research and Development Corporation (GRDC)
- Department of Agriculture and Water Resources
- Rural Industries Research and Development Corporation (RIRDC)
- Commonwealth Scientific and Industrial Research Organisation (CSIRO).

Doing well by doing good – State events

We have been holding regular State-based events on the theme of 'doing well by doing good' since the launch of our 2013 task force report (see Box on page 12). These events enable our State Committees to engage with their stakeholders, highlight the impact of their training activities, encourage involvement of young Australians and raise important food security issues. Through 2015 and 2016, public events were held in Adelaide, Brisbane, Melbourne and Sydney, engaging State Ministers, heads of department and research institutions, the Fund's trainers, and young researchers.

We often invite speakers from ACIAR and its projects to highlight ACIAR's pivotal role in Australia's food security efforts. We also invite our former conference

Sir John Crawford Memorial Address

The Memorial Address in honour of Sir John at our conference networking dinner is an integral part of the event. We feel that the roll-call of presenters is proof positive of the Fund's and Sir John's international standing. In 2014 and 2015 the presenters were Catherine Bertini, former head of the UN World Food Programme, and Cary Fowler, biodiversity conservationist. Hard acts to follow, but in 2016 Professor Louise Fresco, President of Wageningen University and Research Centre, gave an inspiring presentation on the future of our food (see page 2).

We are very pleased to confirm that Dr Lindiwe Majele Sibanda, CEO and Head of Mission of the Food, Agriculture and Natural Resources Policy Analysis Network (FANRPAN) Africa, and member



Professor Louise Fresco presenting the 2016 Sir John Crawford Memorial Address

of ACIAR's Policy Advisory Council, will be delivering the 2017 address.

scholars and other RAID members to encourage other young Australians into agriculture for development. Our targets are our potential partners, stakeholders and, of course, the general public, with media efforts around each event.

One such event, in Brisbane on 16 February 2016 at the Eco Science Precinct, included presentations from young Queensland-based students who had received support with conference and study awards. Agricultural researchers John Schiller and Phil Moody, who have led training for the Fund, spoke about the achievements and challenges of our longer-term capacity-strengthening programs in South East Asia.

A similar event was held by our Queensland Committee in February 2017, this time on a sitting day at Parliament House, with an opening address by the new Queensland Chief Scientist plus a speaker from ACIAR, and our former scholars and RAID members. Queensland parliamentarians were invited to the forum and networking reception.

Building the Fund's network

Our network is essential to our public awareness and training programs, and in 2015–16 networking events were held in Adelaide, Brisbane, Canberra, Hobart and Perth. Our State networking events often aim to encourage more young people into careers, studies and

Benefits globally and locally

Our 2013 task force report, *Doing Well by Doing Good*,¹⁵ considered how, beyond making Australia a good global citizen, investment in international agricultural research also generates direct benefits for Australia that are at least equal to the value of our spending on the programs. This theme has underpinned our ongoing series of State-based public events throughout Australia.

15 www.crawfordfund.org/wp-content/uploads/2014/03/cf_task_force_report.pdf



volunteering in agricultural research and development, so we involve our conference scholar alumni and RAID members (see page 19), and the Government's volunteer program.

A good example was the Western Australia Committee's successful 'Sundowner' event with Murdoch University, held on 8 November 2016. It featured presentations from two Western Australian conference scholars, Xixi Liu and Thomas Taylor, and talks by researchers about their experiences. Increasing interest in these events demonstrates growing awareness of the Fund and of RAID, an appreciation of the opportunity to network with others involved (or hoping to be involved) in international agriculture and sustainable development, and related Australian industries and institutions.

Connecting through international visitors

Farmers and consumers need to be 'pulse smart'

The Crawford Fund comes on board whenever there is a UN-declared year associated with food security. We were especially keen to make an effort for the 2016 UN

International Year of Pulses to heighten public awareness of their nutritional and sustainability benefits. This was greatly assisted in February 2016 when Professor Chandra Madramootoo, a water and food security specialist, and Chair of the International Crops Research Institute for the Semi-Arid Tropics (ICRISAT), visited Australia.



Professor Chandra Madramootoo from ICRISAT

"Pulses are multi-functional crops that are good for nutrition and soil productivity, and are dryland crops that do not need to be irrigated," reported Chandra in

a range of print and radio interviews organised by the Fund.

ACIAR opportunities

Like Sir John Crawford, Professor John Dillon was a staunch supporter of international agricultural research. The ACIAR John Dillon Memorial Fellowships in his memory provide career development opportunities for outstanding young agricultural scientists and economists from ACIAR-partner countries who are involved in a current or recently completed ACIAR project.

The 2016 Fellows visited Australia in March and, with some assistance from the Fund's State Committees, benefited from interesting programs in Tasmania and the Northern Territory. ABC and Radio Australia interviews were arranged for some of the visitors. The experience formed part of their overall program to develop leadership skills in the areas of research management, policy and/or extension technologies, and to receive



Dr Andrew Campbell (centre right) and 'croc legend' Professor Graeme Webb with John Dillon Fellows (left to right) Dr Sathya Khay, Dr Nurul Hilmiati, Dr Nyo Me Htwe, Ms Luanah Yaman and Dr Martin Golman



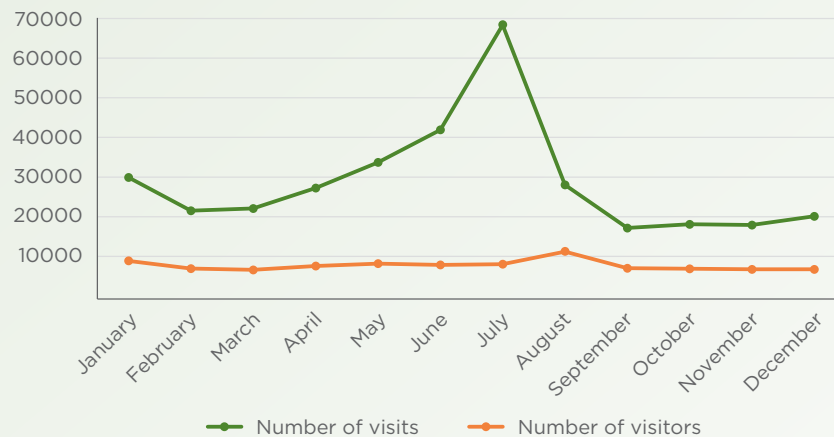
Connecting through social media

We are putting increased effort into our social media presence to complement national mainstream media coverage of our good news stories on international agricultural research. This ties in well with our growing younger audience, who have found us through our relationship with RAID and our conference scholar and student travel awards.

www.crawfordfund.org

Through our web pages and monthly Highlights E-Newsletter,¹⁶ we highlight key news items on food policy as well as our own events and training activities. In 2016, 124 news and training stories were posted, with a total of 344,365 visits from 92,953 visitors, distributed globally. As expected, the peak number of visits was in the lead up to the annual conference, and through the event the number of visitors increased to over 10,000.

Website visits and visitors, 2016



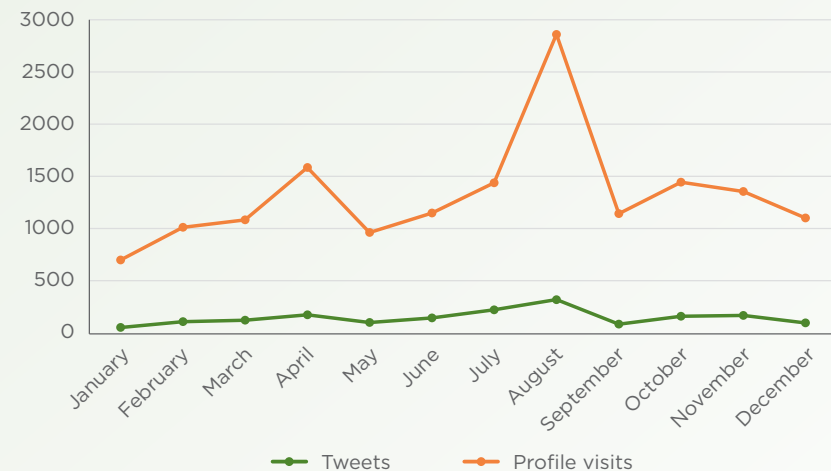
¹⁶ <http://us5.campaign-archive1.com/?u=59501b0b68c660db34160af7d&id=ec96d574dd>

Twitter: @CrawfordFund¹⁷

At the time of writing (February 2017) we have just over 4,000 followers.



Tweets and profile visits, 2016



YouTube¹⁸

In 2016 we uploaded nine videos and our site received 2,825 views. The top three were 'African communities vaccinate against Newcastle disease'; 'A profile on veterinarian Dr Robyn Alders' (page 16); and 'The Crawford Fund Scholar Program'.



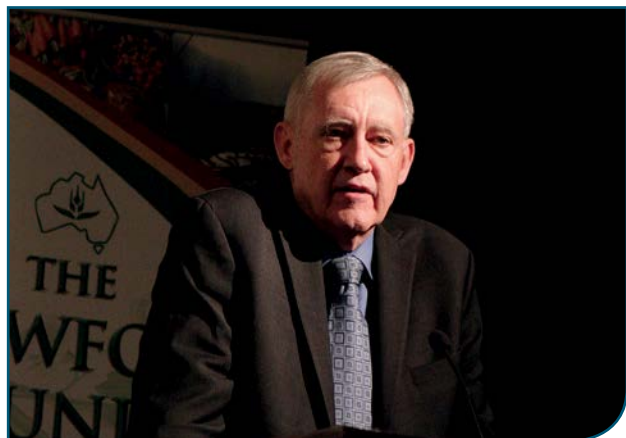
¹⁷ <https://twitter.com/CrawfordFund>

¹⁸ www.youtube.com/user/CrawfordFund

exposure to Australian agriculture across a range of best-practice organisations involved in research, extension and/or policy-making.

Biofortification: nutrition for the world

More than two billion people don't get enough essential vitamins and minerals. This 'hidden hunger' is a leading cause of easily preventable deaths. Undernutrition contributes to almost half of the deaths of children under five, and in most parts of Africa and South Asia one in three children under five is stunted. Dr Howarth (Howdy) Bouis, Director and Founder of HarvestPlus, is a 2016 Laureate of the World Food Prize and no stranger to the Fund, which has assisted him with earlier visits and media outreach in Australia.



Dr Howarth (Howdy) Bouis presenting at the National Press Club

Howdy participated in an event at the National Press Club in August, *Biofortification: nutrition for the World*, co-hosted by the Crawford Fund, ACIAR and the National Rural Press Club. The panel also included Dr Ross Welch, Cornell University; Dr Graham Lyons, The

University of Adelaide; Shannon Ryan, World Vision Australia; Associate Professor James Stangoulis, Flinders University; and Dr Alexander Johnson, University of Melbourne. We were able to arrange extensive national print, radio and TV coverage for Howdy that focused on the science behind biofortification and its nutrition and development benefits, globally and in our region.

Land health surveillance

In October, Dr Keith Shepherd from the World Agroforestry Centre (ICRAF) in Nairobi visited Australia to spread the word about the Centre's important work on soils for food security in Africa. Keith leads the Science Domain on Land Health Decisions and serves as a Principal Soil Scientist at ICRAF. His research focuses on land health surveillance – an evidence-based approach to measuring and monitoring land health (including soil carbon).

Media coverage of the visit, facilitated by the Fund, focused on the first-ever set of digital maps of African soils, which provide detailed information on soil properties at a high level of accuracy. These maps are helping thousands of subsistence farmers to maximise their production of basic food crops.

Crop wild relatives and genebanks: global insurance for climate change

Our next effort was for a visit to Australia in November by Marie Haga, Executive Director and Dr Luigi Guarino, Director of Science and Programs, both of the Crop Trust based in Bonn, Germany. We arranged a public event with a panel discussion on the important role of crop wild relatives and global genebanks in developing adaptation to the impacts of climate change. The event was co-hosted by the Crawford Fund, DFAT and the

National Rural Press Club. As well as our visitors, the panel included Tim Fischer AC, former Deputy Prime Minister (1996–99), past Chair of the Crawford Fund and current board member of the Crop Trust. Marie Haga's visit prompted considerable media interest, with national TV, print and radio interviews arranged by the Fund.



Marie Haga (right), Mr Ewen McDonald (Deputy Secretary, DFAT) (left) and Tim Fischer AC (centre)

After her visit to Canberra, Marie joined scientists and genebank managers from 18 countries at training sessions and meetings in Melbourne. One of our board members, Dr Tony Gregson AM, also attended to discuss the Fund's role in supporting the important work of the Crop Trust and its Svalbard Seed Vault, including a number of media efforts such as support for visits to the vault by TV crews, a film-maker and a journalist.

National meets international

In December, agriculture and food security researchers from eight research centres visited Canberra for



high-level discussions with ACIAR, CSIRO and DFAT. In our outreach to media to coincide with their visit, we highlighted the similarities of Australia's agricultural conditions with those in many developing countries, in terms of soil, water and climatic conditions; interests in the same plant or animal varieties; and pests and diseases. Involvement in international agricultural research translates into benefits not only for the developing countries that are the focus of the work, but also for Australian agriculture and scientists. National print and radio coverage generated by the Fund's media efforts highlighted post-conflict work in Syria by the International Center for Agricultural Research in the Dry Areas (ICARDA), and climate-smart work by the International Center for Tropical Agriculture (CIAT). A feature we facilitated for the international development news site *Devex*¹⁹ received global attention and included ACIAR, CIAT, ICARDA and the International Water Management Institute (IWMI).

Assisting our Australian partners

From time to time, where an event has a particular food security focus, we provide event or media assistance to Australian partners.

Feeding and energising Asia and the Pacific

In February 2016 we were pleased once more to provide media services for the Australian Agricultural & Resource Economics Society's annual conference. There was a strong international component, incorporating workshops on how the CGIAR can boost its contribution to world welfare. The conference also

presented a retrospective on the contribution of many renowned Australian economists working internationally in agricultural economics, acknowledging the work of Sir John Crawford, among others.

The event included an address by Dr Mark Rosegrant, Director of the Environment and Production Technology Division at IFPRI. Dr Rosegrant is known internationally for his modelling of projections and scenarios for global and regional food demand, supply, trade and prices; and for integrating water and energy impacts. We attracted national broadcast and print coverage for the event.

Agribusiness 2030

The Crawford Fund was founded as an initiative of ATSE, and still maintains strong links with the Academy and its newly formed Agriculture Forum. We assisted the Forum with its first public event, *Agribusiness 2030*, in June 2016. The event discussed the latest technology, financing and innovation for the future of Australia's food and agribusiness sector, our food security role in the region, and what will be needed over a 15-year period to realise its potential. Former Crawford Fund conference scholars Lee Hickey and Anika Molesworth delivered presentations at the event and were involved in some of the national media attention that we achieved, especially around impacting community attitudes to genetically modified organisms, and engaging young people in agriculture and agricultural research.

The need to nourish the world

There is growing international awareness of the need for a focus beyond food security onto nutrition security. We assisted with media outreach on this important issue at the *International Symposium on Tropical and*



Anika Molesworth (right) and Lee Hickey (left) being interviewed for ABC by Sarina Locke, the Fund's 2016 Journalism Award winner

Temperate Horticulture held in Cairns in November 2016. Delegates from 23 countries attended the event, supported by the World Vegetable Center and ACIAR.

One of the symposia focused on poverty and hidden hunger, and we arranged for Dr Dyno Keatinge of the Global Horticulture Initiative, formerly Director General of the World Vegetable Center, to be interviewed by print and broadcast media. Dyno made the case for a greater role of horticulture in the fight against micronutrient deficiencies in the world's poorest nations.

"It's no longer good enough to aim to feed the world. We must nourish it."

Dr Dyno Keatinge

¹⁹ Cornish, L. (2017) 'Agriculture and food security – where are we headed in 2017?' *Devex* 11 January. www.devex.com/news/agriculture-and-food-security-where-are-we-headed-in-2017-89419

Recognising our supporters through special awards

Our success is based on people – research leaders and trainers who are seeking to make an enduring contribution to global food security. Their commitment and perseverance, often over long periods, mark the Fund out as a unique contributor. Many go unnoticed and their contributions unheralded.

Crawford Fund medal and patrons

In 2010 the Crawford Fund decided to recognise people who have made a considerable and continued contribution to international agricultural research through our programs and related activities.

2014

The annual conference included a medal presentation to Dr Robyn Alders AO, Principal Research Fellow in the Faculty of Veterinary Science at the University of Sydney, for her contribution to food security and childhood nutrition through her work on animal health. Robyn was also the subject of a Crawford Fund video.²⁰



[A profile on veterinarian Dr Robyn Alders](#)

²⁰ www.youtube.com/watch?v=V-r15rYrGgM

2015

Dr Meryl Williams, Vice Chair of the Scientific Advisory Committee of the International Seafood Sustainability Foundation, and formerly head of the WorldFish Center and chair of the ACIAR Commission, was awarded a medal at the 2015 conference. Meryl has worked for nearly 40 years in Australian and international fisheries, aquaculture, aquatic resource conservation, and agricultural research and development. We developed a tribute to Meryl,²¹ which we showed on the night.



[Tribute to Dr Meryl Williams](#)

2016

Last year we added to the accolades with a new category of 'patron' for people who have shown continuing support for the Fund and international agricultural research for development. Three outstanding and recent Chairs of the Board all accepted our invitation to be patrons – Jim Ingram AO, former Chief Executive of the World Food Programme and a former head of the Australian International Development Assistance Bureau (precursor of Australian Aid); The Hon. Tim Fischer AC, former Deputy Prime Minister of Australia;

²¹ www.youtube.com/watch?v=8VGbx1sAk2o



Jim Ingram (far left), Tim Fischer (centre left) and Neil Andrew (right) received 2016 patron awards from John Kerin

and The Hon. Neil Andrew AO FTSE, former Speaker of the House of Representatives. The award was presented by our current Chair, The Hon. John Kerin AM, who has since been named a patron on his retirement as Chair.

Seeing is believing – putting journalists on the ground

The Crawford Fund's public awareness campaign supports visits by Australian journalists to agricultural research projects throughout the developing world. Over the years, destinations for journalists have included Burundi, Cambodia, Indonesia, Kenya, Lao PDR, Mexico, Peru, the Philippines, the Solomon Islands, Syria, Taiwan, Tajikistan, Tanzania, Thailand, Timor-Leste, and Vietnam. These visits provide journalists with an opportunity to see and report, first-hand, the work being done to improve agriculture, fisheries and forestry in developing countries through research and training.



Food Security Journalism Award

Some visits are arranged for winners of the Fund's Food Security Journalism Award, launched in 2013 with the Australian Council of Agricultural Journalists to encourage Australian journalists to investigate the important roles that agricultural research, training and rural development play in global food security. The winner of the 2016 Award was Sean Murphy from ABC TV's iconic rural current affairs program *Landline*.



Cathy Reade, Elizabeth Finkel and Sarina Locke (left to right) visited Timor-Leste in April 2016

In April 2016, two previous winners – Elizabeth Finkel, editor of the science magazine *Cosmos* (2013 Award), and Sarina Locke, national reporter for ABC Rural (2015 Award) – visited Timor-Leste with the Fund's Director of Public Affairs, Cathy Reade. Food and nutrition security is a continuing and major challenge for the young nation of Timor-Leste – more than half of children aged under five are stunted, one of the highest rates in the world. Subsistence agriculture is carried out by up to 80% of the population and certain times of year are marked by food scarcity in many villages. During their visit, Elizabeth and Sarina attended Timor-Leste's most

significant food security conference, TimorAg 2016. On their return there were a range of media reports, including on Radio Australia, Radio National Breakfast, Radio National Country Breakfast, and a variety of ABC *Country Hour* programs. Sarina also participated in four live interviews with Australian radio during her stay.

Responsive media outreach

As well as the planned media coverage described above, we also respond to events via both traditional and social media, as the following examples demonstrate.

International Women's Day

In 2016 we partnered with ACIAR to present two short videos showcasing women and agricultural development in Vietnam, filmed by documentary maker Sally Ingleton and the Fund's Cathy Reade. *From personal to national development* features Dr Ngheim Quynh Chi's contributions to cutting-edge science in the traditionally male-dominated discipline of tree breeding.²² And in *Vegetables making a difference* Dr Suzie Newman from Global Food Studies at The University of Adelaide explains the dual need for improved vegetable production systems and access to markets in Vietnam.²³ The video describes an innovative project that is helping women and their families from minority groups in impoverished north-west Vietnam through improved production and marketing of indigenous and everyday vegetables.

Seeds of Time

Following on from Dr Cary Fowler's 2015 Sir John Crawford Memorial Address (see page 2), we were

²² www.youtube.com/watch?v=QKfFh_1zbag

²³ www.youtube.com/watch?v=RO-aOPWrfS8



From personal to national development



Vegetables making a difference

approached by both the SBS TV program *Destination Flavour* and the program *60 Minutes* to assist with visits to the Svalbard Seed Vault. The cooking program aired in May 2016 and explained the Vault's aim to protect the world's food resources. And the *60 Minutes* story, shown in June 2016, described Cary's remarkable work on conserving crop diversity through the Global Seed Bank. The Fund was able to encourage coverage of the Australian angle: interviews with Fund board member Tony Gregson and the Australian Grains Genebank added detail on Australian efforts around seed collecting. We also promoted screenings of the



movie *Seeds of Time*²⁴ in regional Victoria, following its Australian premiere at the 2015 conference. The documentary describes the work of Cary Fowler and the Crop Trust in protecting crop genetic resources, including the establishment of the Svalbard Seed Vault.

Policy papers and submissions to parliamentary inquiries

An important component of our public awareness strategy is working with influencers, partners and the general public through policy documents and task force reports.

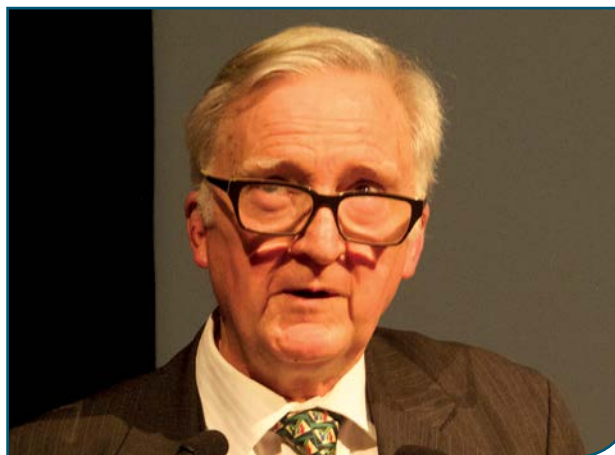
Bread from stones

Our 2015 policy paper with Murdoch University – *Bread and stones: Co-investing in mining and agriculture in Africa* – makes the compelling argument that the downturn in world ore, metal and energy prices, with the concomitant ‘cooling’ of investment activity in the extractive sector, could be a window of opportunity for investment in agribusiness in Africa and further afield. The document followed on from the 2013 conference (see page 2). It attracted media attention at its launch in late 2015 at the Africa Australia Research Forum,²⁵ and was promoted and discussed at the 2016 Africa Down Under²⁶ event in Perth.

Innovation and partnership

Two parliamentary inquiries in 2015–16 provided an opportunity to explain the importance of Australia’s support for international agricultural research.

In the 2015 *Inquiry into Australia’s Future in Research and Innovation*,²⁷ the Fund encouraged the Standing Committee to consider the international context in exploring innovation in Australia’s agricultural industries. A submission in September pointed out that the quantified benefits to Australia, from just 48 of ACIAR’s 600 bilateral projects, exceeded \$2.5 billion – a sum close to *total* ACIAR investments since the Centre’s inception in 1982.



“It is through innovation and R&D that we can produce food more sustainably and aim to freeze environmental impacts.”

Dr Denis Blight AO, Crawford Fund CEO,
submission to 2015 Inquiry

The Fund also made a submission to the Foreign Affairs and Aid Sub-Committee’s inquiry on *The role of development partnerships in agriculture and agribusiness in promoting prosperity, reducing poverty and enhancing stability in the Indo-Pacific region*.²⁸ Our submission made good use of our *Doing Well by Doing Good* task force report (page 12), and explained that Australia and its developing country partners in the Indo-Pacific region have benefited substantially from decades of global and Australian investment in international agricultural research.

Noting that the total rate of return on ACIAR’s investments has been 70:1, it also pointed out that by taking novel approaches, the Fund, ACIAR, Australian research institutions, and some centres within the international agricultural research system have demonstrated that partnerships between small and medium-sized entrepreneurs can be critical to the successful application and up-scaling of new technologies in agriculture and food value chains.

Aid and foreign policy

Through late 2016 we worked on our submission on the DFAT *Foreign Policy White Paper*, submitted in early 2017.²⁹ It calls for increased aid investment in agricultural research as an effective form of aid, an emphasis on agricultural productivity improvements as an Australian asset, and documents compelling evidence on the causal relationship between food insecurity and national and regional stability.

24 www.seedsoftimemovie.com

25 www.crawfordfund.org/wp-content/uploads/2014/03/crawford_fund_2013_conference_program.pdf

26 www.africadownunderconference.com

27 www.aph.gov.au/ResearchandInnovation

28 www.aph.gov.au/Parliamentary_Business/Committees/Joint/Foreign_Affairs_Defence_and_Trade/Development-Agriculture

29 www.crawfordfund.org/wp-content/uploads/2017/03/Crawford-Fund-Submission-on-the-Foreign-Policy-White-Paper-Final-Monday-Feb-26.pdf

Harnessing youthful enthusiasm

We are continuing our efforts to foster the interest and harness the passion of young agricultural students and scientists in international agricultural research and development, an area that has really enthused our public awareness program and State and Territory Committees.

New RAID-Crawford Fund alliance

The Fund has been a strong supporter of the development and growth of the RAID network since its establishment in 2013. A new partnership, announced in 2016, enables RAID and the Crawford Fund to work together more closely to engage and support early- to mid-career researchers with an interest in agriculture and international development. Under the new arrangement, RAID will function as an independent committee of the Crawford Fund.



RAID is now playing a much greater role in our conference scholar program and is partnering with the Fund in networking events. We are confident the partnership will benefit young Australian agriculturalists.

Our scholar program

We have supported young agricultural scientists through the scholar program since 2010, and our alumni group now numbers 175. Scholarships to attend the annual conference and scholar day are awarded to young students and scientists with an interest in international agricultural development. We are particularly lucky that our speakers and presenters actively

engage with the conference scholars at the event, as they are a tremendous source of encouragement and inspiration.

In 2016, 48 young Australians from every State and Territory attended our annual conference in Canberra, 31 supported by the Fund's State Committees and the remaining 17 by universities, the private sector and other institutions. The full list of conference scholars, their sponsors and their post-conference reports is available on our website.³⁰



The 2016 conference scholars

New elements in 2016 included pairing scholars with mentors, and providing two half days of activities before and after the conference. We encourage our alumni to join the RAID network and to maintain contact with the Crawford Fund. From time to time we contact the full group of 175 alumni.

³⁰ www.crawfordfund.org/events/2016-conference/2016-conference-scholars/

What our scholars reported

"The highlight for me during these few days in Canberra was being paired with my very inspiring mentor, Lester Burgess, who is incredibly experienced and knowledgeable, as well as a genuine and kind individual."

Asher Taccori,
University of Wollongong

"Dr Fresco addressed the audience with grace and passion. She instantly became a significant role model to me. She was a strong, intelligent woman with the ability to command and to hold an audience spellbound with the stories of her research and her life."

Rebecca Cotton,
University of the Sunshine Coast

"It was fantastic to be surrounded by people with great enthusiasm for the work they do; all of them looking towards providing a food-secure world. I can't help but be optimistic, given the range of solutions presented throughout the conference."

Jessica Mackay,
The University of Adelaide



International Agricultural Student Awards

Throughout 2016 some State Committees offered travel awards in the form of a bursary (usually up to \$3,000) open to tertiary students with a keen interest in gaining experience in international agricultural research and development. The overseas projects with which students plan to link may be governmental, NGO, commercial or associated with a university, and

are often related to an ACIAR project. Applicants are generally required to be in a relevant biophysical or socioeconomic field of agriculture, animal production, fisheries, forestry, natural resource management or food security. At the end of 2016, awards were available in Queensland, Western Australia and New South Wales, with 2017 awards likely for Tasmania, South Australia and the Northern Territory.

Travel for a purpose

Our Western Australian Committee funded a student, Erin Pope, for a three-week work experience opportunity in Ethiopia with ACIAR's Farm mechanisation and conservation agriculture for sustainable intensification (FACASI) project.³¹ At the start of January 2016 she set off to Addis Ababa to learn more about mechanisation for smallholder farmers in a region where agriculture is predominantly



A two-wheeled tractor in action, Ethiopia

physically intensive subsistence farming using traditional hand tools and animal-operated implements.

During her visit, Erin contributed to a training manual, which outlined basic business education and training activities to use as a teaching resources. She also wrote a report for the FACASI newsletter.

For more highlights of the Fund's State and Territory Committees' support for young agriculturalists, see pages 23–29.

"This experience pushed me far out of my comfort zone as I traded the familiar feel of the university classrooms for the bustling city streets of Addis Ababa. Being able to travel for a purpose through developing areas has fuelled my interest in international agriculture and especially towards extension work as a future career option."

Erin Pope, student

³¹ <http://aciarc.gov.au/aifsc/projects/farm-mechanisation-and-conservation-agriculture-sustainable-intensification-facasi>

Innovative mentoring program in Lao PDR

Our mentoring program in Lao PDR pairs Australian volunteer researchers working in developing countries with experienced Australian experts who can help increase technical and organisational skills. Both mentors and researchers work to develop the capacity and skills of local farmers. Since 2012, nine Australian researchers have volunteered for our Laos project in Pakse, Savannakhet and Vientiane with the Australian Volunteers for International Development (AVID) program, managed by Scope Global.³² Our Lao PDR mentoring program lead, Professor Lester Burgess, has developed an innovative team-volunteering initiative over many years with Crawford Fund support (see page 9). The volunteers work in partnership with the Lao PDR Ministry of Agriculture and Forestry, and with global experts within Lester's network in agricultural science, all supporting Lao farmers to improve crop production, yield and food safety to facilitate exports of rural products. Our efforts were highlighted in Lao PDR when our recent volunteer Kylie Ireland featured on a promotional billboard at the Australian Embassy for International Volunteer Day 2016. A further four volunteer positions are to be filled in the 2017 intake.

Communicating impact

Since 2002, the Fund has been an Australian Partner Organisation for around 25 communication placements in countries including Bangladesh, China, Fiji, Ghana, Indonesia, Kenya, Lao PDR, the Philippines, Sri Lanka, Tanzania and Vietnam, generally in international agricultural research centres. In a range of positions working with both traditional and new media (websites, social

³² www.volunteering.scopeglobal.com



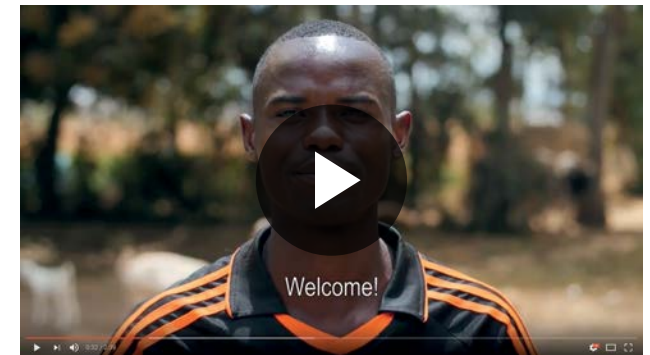
Kylie Ireland promoting Australian volunteering in Lao PDR

media, video and multimedia formats), young Australian communications graduates have spent about a year helping to improve the communication efforts in the developing world around forestry, rice, water, fish, live-stock, bioscience and agroforestry.

Throughout 2016 we contributed as an Australian Partner Organisation for a volunteer videographer with the World Vegetable Center in Tanzania, managed by Australian Volunteers International (AVI).³³

Rhiannon O'Sullivan made a range of videos for the Center, including a series about ACIAR's VINESA project on improving nutrition and income by enhancing vegetable-based farming and food systems in peri-urban areas.^{34,35}

As an added bonus, Rhiannon is a finalist in USAID/Feed the Future's 2016 international photo contest: 'Photos of progress: What it looks like when development works'.³⁶



Baraka's Story: Contract Farming



Joshua's Story: Producing Seed

33 www.avi.org.au/

34 <https://avrdc.org/barakas-story-contract-farming/>

35 <https://avrdc.org/producing-pepper-seed/>

36 <https://feedthefuture.gov/article/photos-progress-what-it-looks-like-when-development-works>

Master Class and training program

Master Classes – sharing expert knowledge

One of our main goals is to improve knowledge, skills and extension capacity in the countries in which we operate. Our Master Classes for mid-career scientists and managers introduce participants to state-of-the-art concepts, innovations and underpinning skills. Classes are at least one week long, and are presented by world leaders in their respective fields.

In addition to Master Classes on *Communicating with Stakeholders*, delivered as part of the Australia-Africa Plant Biosecurity project (see page 5), a selection of our 2015-16 Master Classes are briefly described below; full details may be found at www.crawfordfund.org/wp-content/uploads/2017/05/Master-Classes-Since-2011.pdf.

Methods for assessing data-poor fisheries

**Institut Pertanian Bogor (Bogor Agricultural University)
International Convention Center, Indonesia, 24–28
August 2015**

Organised by Professor Neil Loneragan of Murdoch University, this Master Class aimed to enhance participants' understanding of approaches for evaluating fisheries where few data on catches or fishing effort are available. The class built on previous ACIAR Fisheries-funded projects on tuna; illegal, unreported and unregulated fisheries; and the development of a strategic plan for Indonesia's capture fisheries. The aim was to achieve a better understanding in Australia of the current research capacity, research issues and priority areas for research and capacity building in Indonesian capture fisheries, and improved capacity of Indonesian fisheries professionals.

GOAL

**National Agricultural Science Complex of the Indian
Council of Agricultural Research, New Delhi, India,
16–20 November 2015 and 11–15 November 2016**



Working Group at the 2015 GOAL Master Class

These Master Classes, conducted with the cooperation and financial support of the Crop Trust, introduced national and regional genebank personnel to the concepts of quality management systems and standard operating procedures to facilitate the introduction of common, globally acceptable standards for genebank management. The intended outcome is to enable participants to engage with the International Treaty on Plant Genetic Resources for Food and Agriculture (the International Seed Treaty) and its multilateral system for access and benefit sharing. The classes were coordinated and part-delivered by Dr Michael Mackay of The University of Queensland. The 2015 training introduced the participants to the international management and information standards that must be used by genebanks to participate in the global community. By the conclusion of the 2016 Master Class, the 11 participating genebanks had developed the outline for their operational manual.

Building capacities for integrated agricultural catchment management

**Royal Irrigation Department (RID), Bangkok, Thailand,
26–30 October 2015**



Discussing planning methods for agricultural catchment management at the Bangkok Master Class

Presented by Anthony Jakeman and Wendy Merritt (ANU), Allan Curtis (Charles Sturt University) and Serena Hamilton (Edith Cowan University), this Master Class was designed and delivered via a formal partnership with the Office of Agricultural Affairs, Royal Thai Embassy (Canberra) and support from RID.

The class aimed to enhance the capacity of planners, managers and policy-makers to undertake holistic planning to improve water management and agriculture across Southeast Asia, focusing on integrated approaches to project development, implementation and evaluation. The concepts of integrated assessment and integrated catchment management provide a set of interdisciplinary tools to communicate the effects

Master Class and training program

of policy and management options to decision-makers and the wider community. Thailand is Southeast Asia's second largest economy, and this partnership with the Office of Agricultural Affairs, the Royal Thai Embassy and RID also has the potential to benefit Australia through future joint research initiatives and learning for Australia's agricultural industries.

Soil productivity – growing agriculture

Sydney, Menangle and Wollongbar, New South Wales, Australia, 9-13 May 2016

Organised by Georgina Kelly of NSW Department of Primary Industries and Sydney University, with significant contributions from CSIRO, this class focused on soil security, productivity and sustainability, to improve the capacity of business, government and research leaders in Australia and neighbouring Asian/Oceanic countries to deal with emerging issues of soil productivity. The five-day course was attended by 11 international delegates from nine different countries. Three of the participants were finishing their doctorates in Australia at the time.

Soilborne pathogens of wheat

Transitional Zone Agricultural Research Institute, Eskisehir, Turkey, 11-23 July 2016

Following on from our involvement in previous Master Classes on this topic, we supported a fifth Master Class along with donors including CIMMYT, Syngenta AG, ACIAR, Dikmen Fide Company, GRDC, and the Turkish Ministry of Food, Agriculture and Livestock. The training event, which included 32 young scientists from around the world, enhanced capacity in soilborne pathogen research in cereals – this time focusing on Central and West Asia and North Africa.

Agricultural research leadership and management

WorldFish Center, Penang, Malaysia, 6-12 November 2016

This five-day program covered all aspects of management and leadership of research and development, with an emphasis on the needs of research professionals operating in national agricultural research systems and CGIAR research centres worldwide. It was sponsored by ACIAR, the Asia Pacific Association of Agricultural Research Institutions, CIAT, CIMMYT, ICARDA, ICRAF, ILRI, IWMI and WorldFish. Participants gained a strong understanding of the importance of people management, and a realisation that they themselves had many experiences that they could learn from and share with their peers. Many participants are now working with Shaun Coffey, who led the Master Class, to develop some of the ideas introduced and to build a community of practice (see a video of participants' views³⁷ on the experience).



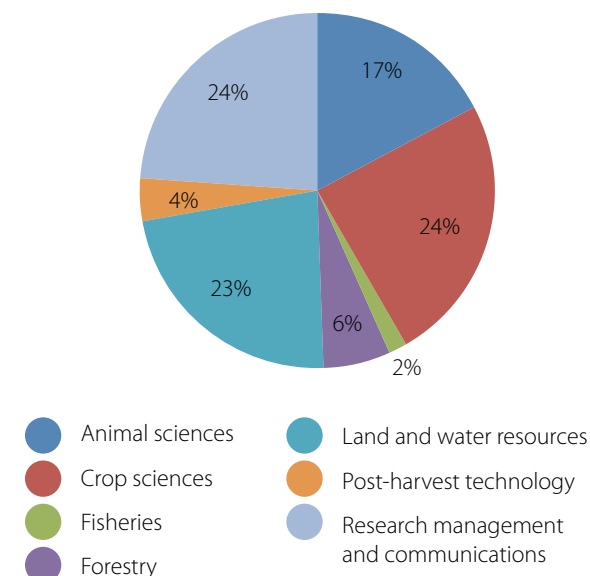
Our inaugural Master Class in Agricultural Research Leadership & Management

37 www.youtube.com/watch?v=tsu98ODvIYo&feature=youtu.be

Training and awards – investing in the future

Most of our training activities are generated by the Fund's State and Territory Committees, and the subjects covered are extremely diverse.

Course topics 2012-16 (155 courses attended by around 2,080 individuals)



Training for younger scientists, technical support and extension staff is for a few days, up to three months for individuals, and is led by experienced practitioners. Individual training programs may be tailored for students or young scientists from other countries to visit key research agencies and universities in Australia; and for Australian students to gain overseas experience. A snapshot of training from each State and Territory for 2015-16 is featured on the following pages, and a full list can be viewed online at www.crawfordfund.org/wp-content/uploads/2017/05/P-23-Overview.pdf.



Australian Capital Territory (ACT) Committee



Crawford Fund-sponsored Student Ambassadors learning how to carefully inspect soil cores to count crop roots

Roots down under – Belowground solutions to global challenges, the Ninth International Symposium of the International Society of Root Research (ISRR) (Canberra, 2015), attracted 300 delegates from 35 countries working on improved root and rhizosphere function for different plant production systems. Seventy of the delegates were students, including 24 Student Ambassadors from around the world, sponsored by the Fund. Prior to the meeting, the students used social media to promote the symposium, ran a 'Crazy Root' competition to stimulate interest, and wrote a guide for students on getting the most out of international meetings. Most Ambassadors presented posters or papers, and also acted as co-chairs for the sessions and summarised the meeting's highlights. The ISRR Committee has decided that our Student Ambassador program will become a permanent part of all future meetings.

New South Wales Committee



Social science students in Timor-Leste discussing their findings

Two courses, in Indonesia and Timor-Leste, focused on the social dimensions of research and development in farming. Participants in both courses found data collection through interviews and observation to be the most useful component. The courses, facilitated by social scientists Dr Joanne Millar from Charles Sturt University, NSW and Dr Muktasam Abdurrahman from Mataram University, Indonesia, improved the capacity of research, extension and animal health staff to apply their work more closely to farmers' needs, implement sound farmer learning processes, and evaluate impacts using rigorous social research methods.



Learning digital soil mapping skills

Dr Rudiyanto, a Crawford Fund trainee from Bogor Agricultural University, Indonesia (right), spent time at Sydney University with Professor Budiman Minasny (left), learning how to use digital soil mapping to estimate the depth of tropical peatlands and the amounts of carbon stored in them.





Discussions for extension recommendations on durian disease management

Thirty Cambodian farmers took part in a durian disease-management training workshop in March 2016. The participants discussed and drafted extension recommendations, the first to be produced for Cambodian durian farmers.

Northern Territory Committee



Learning from and for indigenous communities

“Visiting the Aboriginal community of Nauiyu [Daly River] provided me with new ideas on how we can improve livelihoods and make them more sustainable for people on the Banda Islands,” says Dinawanti La Rae, one of two Indonesian field officers from the Locally Managed Marine Area network who experienced training and field visits in Australia on natural resources and indigenous livelihoods.

“Tuna and nutmeg are the two main sources of livelihood for islanders there, and there is good scope to develop these in ways that are ecologically sustainable and provide secure income.”



Learning the art of manipulating mango flowering

The NT Committee funded extra workshops linked to the 2015 Mango Symposium. Extensive training on mango research for international participants was held at Charles Darwin University and Berrimah Agriculture Research Farm. Targeted at research scientists wishing to update their skills, the training covered biotechnology, plant pests, flowering manipulation, tools for precision, and experimental design.

Queensland Committee



Rodent trap success!

A workshop on ecologically based rodent management in agricultural and urban communities was held for participants from the Ministries of Agriculture and Health in Fiji. Rodents are both agricultural pests and also the source of leptospirosis – a major cause of human illness and mortality, mostly in agricultural communities.

Trainees from Vietnam and Lao PDR received training in developing composite products at the Queensland Department of Agriculture and Fisheries' Salisbury Research Facility, including methods to produce multi-laminar veneer and alternative composites from agrifibre residues.



Trainees show off their first composite product made from sorghum residues

South Australian Committee



Irrigation management training

Thirty-one agricultural extension specialists took part in a training course in participatory irrigation management for maintaining regional food and water security in northern India. The week-long course was a joint program with the Australian Water Partnership. Irrigation for the rice-wheat cropping system continues to draw down on the region's limited groundwater reserves, which are dropping at a rate of up to 100 mm per year across the Indo-Gangetic Plains. According to local Haryana farmer Vikas Chaudhary, if change is to occur at the field level, farmers need to be engaged on an equal footing as partners in on-farm



Master Class and training program

demonstrations. Vikas has been responsible for leading a major on-farm participatory demonstration program on his farm, which has successfully engaged with many of his local village's younger farming community.



Using wastewater for irrigation workshop

Workshop delegates from Rajasthan, Gujarat, Delhi and other parts of India sharing their knowledge and experiences on using wastewater for irrigation. The workshop incorporated data from a related project analysing water quality along India's Ahar River.

Tasmanian Committee



Training for ACIAR Cocoveneer project

Two young South Pacific islanders, Moana Bergmaier-Masau (pictured) and Ilikimi Carati-Bokadi, received six weeks' hands-on training at Australia's leading timber product research facility in Brisbane. The training was organised by the University

of Tasmania, where Professor Greg Nolan is project leader of the ACIAR-funded Cocoveneer project to produce sustainable veneer products from aged coconut palm stems and utilise residues for agricultural and other by-products.



Muse getting familiar with Tasmanian wildlife

Mr Muse Opiang, an experienced conservation biologist from Papua New Guinea, benefited from a four-month internship in Tasmania. Muse – pictured here with a long-beaked echidna – helped develop technical guidelines on natural and cultural values, similar to those used by Tasmanian forest planners, to support the Papua New Guinea Logging Code of Practice. With over 800 languages in Papua New Guinea, communicating

the main messages and management ideas from the Code of Practice to everyone involved is a daunting task. Translating the English versions into the language that is common across Papua New Guinea (Tok Pisin) has been difficult as many English words can't be directly translated. Muse has made a good start with a technical guidelines and landowner poster produced as part of his Crawford Fund training project.

Victorian Committee

In 2015-16, three village communities in the Sabeto Catchment in Fiji received Landcare training on land and river management of the catchment and how to reduce extensive land degradation following heavy storms, with inputs from the Secretariat of the Pacific Community and experts from Australian Landcare International.³⁸

38 <http://alci.com.au>





Discussions on Landcare in Fiji



Veneer from waste products

Building on previous work making veneer from waste materials, young people from Vietnam and Lao PDR received training in sustainable furniture design, from conceptualising the product to producing prototypes, and experimented with solid wood, veneer and wood composites. The training provided a significant contribution towards two ACIAR-funded projects in Lao PDR and Vietnam. “I will definitely try to introduce green design concept in my country,” said Dang Truong Vu.



Group discussions for treegrowers

The fourth in our series of Treegrower courses in Africa, held in 2015-16 in Ethiopia, included theoretical, practical and dramatic presentations, shared experiences and group discussions. Following morning sessions on theory, afternoons were spent conducting practical demonstrations in local communities, and promoting local champions.

Western Australian Committee

A highlight of 2016 was the training activity by Laura Boykin in Kenya, on whitefly identification. Over 100 students from 17 African countries received training in diagnostic tools to identify whiteflies and whitefly-transmitted viruses that compromise global and Australian agriculture.



Fun and hard work around whiteflies in Africa





Whitefly training at Kamiti Prison

Whitefly training also took place at Kamiti Medium Security Prison in Nairobi, where many of the prisoners are farmers and grow cassava on the prison farms. By this means, life skills are transferred not only to inmates, but also to farm managers from around Kenya.

Associate Professor Ed Barrett-Lennard of the University of Western Australia worked with local



Dr Barrett-Lennard demonstrating the EM38

Crawford Fund Fellowship 2015-16

The 2015 Crawford Fund Fellowship was awarded to Ms Aye Sandar Phyto from Myanmar. Ms Phyto is a Research Associate at the Asian Institute of Technology. She has a Master of Science (Regional and Rural Development Planning) from the Asian Institute of Technology in Thailand.



Sandar facilitating a focus group discussion on extension services in September 2015

Sandar works on the application of socioeconomic research to support improved agricultural practice. By linking agricultural innovations with social science knowledge on social, cultural and institutional settings, agricultural innovations can be designed

“The teaching style here is very different. In Australia, the teacher encourages participation and for students to speak up in discussion, which makes the class interesting and time goes quickly.”

Ms Aye Sandar Phyto, Research Associate

and adapted to better suit the local and regional context, and have more lasting impact for small-holder households.

During her 11-week Fellowship visit, Sandar was hosted by CSIRO Land and Water,³⁹ in Brisbane, where she benefited from two training courses, in scientific writing and publishing with impact, to support the development of a manuscript. She has also taken the opportunity to discuss her work with scientists at The University of Queensland and CSIRO, developing her networks and understanding of the breadth of theories and approaches in international agricultural research.

³⁹ www.csiro.au/en/Research/LWF

cereal breeders and soil scientists in Pakistan to deliver a training course on phenotyping cereals in variably saline landscapes. Phenotyping involves determining the observable characteristics of crop varieties that clearly result from genetic manipulations. But variable salinity in the field makes selecting adapted crop varieties difficult – on any particular plot of land, growth may be better either because the crop variety planted is more salt tolerant, or simply because the land is less saline. The training course, held at the University

of Agriculture in Faisalabad, demonstrated a new technology, the EM38, an instrument that measures the apparent electrical conductivity of soil. This can help plant breeders remove the statistical effects of variation in salinity from their plant variety trials. Dr Barrett-Lennard commented that “For the first time, thanks to Australian research, genes for improved salt tolerance in wheat are now ‘on the shelf’ and these should be rapidly introgressed into all Pakistani wheat lines.”

FINANCIAL REPORT

This financial statement is an extract from the 2015-16 Directors' report. The full report, with accompanying notes, can be found on our website.⁴⁰

Crawford Fund Limited ABN 86 1 41 714 490

STATEMENT OF PROFIT OR LOSS AND OTHER COMPREHENSIVE INCOME FOR THE YEAR ENDED 30 JUNE 2016

	2016 (\$)	2015 (\$)
Revenue from government and other grants	1,131,465	1,262,750
Other income	366,622	319,105
<i>Total revenue and other income</i>	<i>1,498,087</i>	<i>1,581,855</i>
Employee benefits expense	(221,700)	(234,554)
Depreciation expense	(6,447)	(6,536)
Rental expense	(49,658)	(52,233)
Audit, legal and consultancy expenses	(9,254)	(13,925)
Program expenses	(1,163,923)	(1,137,223)
Other expenses	(68,134)	(64,619)
<i>Total expenses</i>	<i>(1,519,116)</i>	<i>(1,509,090)</i>
Surplus for the year	(21,029)	72,765
Other comprehensive income for the year	-	-
Total comprehensive income for the year	(21,029)	72,765

Crawford Fund Limited ABN 86 1 41 714 490

STATEMENT OF FINANCIAL POSITION AS AT 30 JUNE 2016

	2016 (\$)	2015 (\$)
ASSETS		
CURRENT ASSETS		
Cash and cash equivalents	536,150	863,706
Trade and other receivables	123,850	49,782
Other financial assets	387,733	40,344
Other assets	48,121	65,999
<i>TOTAL CURRENT ASSETS</i>	<i>1,095,854</i>	<i>1,019,831</i>
NON-CURRENT ASSETS		
Plant and equipment	15,043	21,490
<i>TOTAL NON-CURRENT ASSETS</i>	<i>15,043</i>	<i>21,490</i>
TOTAL ASSETS	1,110,897	1,041,321
LIABILITIES		
CURRENT LIABILITIES		
Trade and other payables	292,431	210,601
Provisions	28,011	26,807
<i>TOTAL CURRENT LIABILITIES</i>	<i>320,442</i>	<i>237,408</i>
NON-CURRENT LIABILITIES		
Provisions	33,921	26,450
<i>TOTAL NON-CURRENT LIABILITIES</i>	<i>33,921</i>	<i>26,450</i>
TOTAL LIABILITIES	354,363	263,858
NET ASSETS	756,534	777,463
EQUITY		
Accumulated surplus	756,434	777,463
TOTAL EQUITY	756,434	777,463

40 www.crawfordfund.org/wp-content/uploads/2017/03/Crawford-Fund-Financials-2016-signed-31-Aug-2016.pdf

Financial Report

Crawford Fund Limited ABN 86 1 41 714 490

STATEMENT OF CHANGES IN EQUITY FOR THE YEAR ENDED 30 JUNE 2016

	Accumulated surplus (\$)	Total (\$)
Balance at 1 July 2014	704,698	704,698
Total comprehensive income for the year	72,765	72,765
Balance at 30 June 2015	777,463	777,463
Total comprehensive income for the year	(21,029)	-21,029
Balance at 30 June 2016	756,434	756,434

Crawford Fund Limited ABN 86 1 41 714 490

STATEMENT OF CASH FLOWS FOR THE YEAR ENDED 30 JUNE 2016

	2016 (\$)	2015 (\$)
CASH FLOWS FROM OPERATING ACTIVITIES		
Receipt of grants	1,131,465	1,262,750
Other receipts	426,201	300,639
Payments to employees and suppliers	(1,569,100)	(1,453,242)
Interest received	31,167	39,206
Net cash provided by (used in) operating activities	19,733	149,353
CASH FLOWS FROM INVESTING ACTIVITIES		
Proceeds from sale of (payment for) other financial assets	(347,389)	-
Payment for plant and equipment	-	(7,712)
Net cash provided by (used in) investing activities	(347,389)	(7,712)
Net increase (decrease) in cash held	(327,656)	141,641
Cash and cash equivalents at the beginning of the financial year	863,706	722,065
Cash and cash equivalents at the end of the financial year	536,050	863,706



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Communications and Admin Assistant

Vale Ian MacKinnon



The Crawford Fund family was saddened by the passing of board member and inaugural Tasmanian chairman, Mr Ian McLean MacKinnon AM, on 11 March 2016, as the result of a farm accident.

Ian was the foundation chair of the Fund's Tasmanian Committee, and was well known and respected in Tasmania, Australia and internationally. Many people who knew Ian remember the good times in which his company, friendship and work made such a valued contribution to Tasmanian, Australian and global agriculture.



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Research Institute for the Environment and Livelihoods, Charles Darwin University

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	Mr Tim Eldridge	Policy and Legislation, Agrigrowth Tasmania; Department of Primary Industries, Parks, Water and Environment, Tasmania



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Senior Lecturer in Crop Science, Tasmanian Institute of Agriculture, University of Tasmania
Senior Lecturer in Survey and Spatial Science, Discipline of Geography and Spatial Sciences, School of Land and Food, University of **Tasmania**
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Director, AgInsight
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School of Animal Biology, The University of Western Australia
School of Biological Sciences and Biotechnology, Murdoch University
Principal, Rural Research Consultancy
Private consultant
Director, UWA Institute of Agriculture, Faculty of Natural and Agricultural Sciences, The University of Western Australia



Acronyms

AAHL	Australian Animal Health Laboratory	ICARDA	International Center for Agricultural Research in the Dry Areas
AARES	Australian Agricultural & Resource Economics Society	ICRAF	World Agroforestry Centre
ACIAR	Australian Centre for International Agricultural Research	ICRISAT	International Crops Research Institute for the Semi-Arid Tropics
ANU	Australian National University	ICT	information and communications technology
ATSE	Australian Academy of Technological Sciences and Engineering	ILRI	International Livestock Research Institute
AVI	Australian Volunteers International	ISRR	International Society of Root Research
AVID	Australian Volunteers for International Development	IWMI	International Water Management Institute
CABI	Centre for Agriculture and Biosciences International	OECD	Organisation for Economic Co-operation and Development
CGIAR	Consultative Group on International Agricultural Research	PBCRC	Plant Biosecurity Cooperative Research Centre
CIAT	International Center for Tropical Agriculture	RAID	Researchers in Agriculture for International Development
CSIRO	Commonwealth Scientific and Industrial Research Organisation	RIAD	Rabies Immunoperoxidase Antigen Detection test
CIMMYT	International Maize and Wheat Improvement Center	RID	Royal Irrigation Department, Bangkok
DFAT	Department of Foreign Affairs and Trade (Australia)	RIRDC	Rural Industries Research and Development Corporation
FANRPAN	Food, Agriculture and Natural Resources Policy Analysis Network	SFSA	Syngenta Foundation for Sustainable Agriculture
GRDC	Grains Research and Development Corporation		

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