Multilateral program

AOP budgeted expenditure in 2004–05	$9,370,000
Actual expenditure in 2004–05	$9,984,197
Expenditure in 2003–04	$10,200,514
Expenditure in 2002–03	$9,827,219
Proportion of total ACIAR expenditure 2004–05	**19.4%**

Key performance indicators	Performance 2004–05
• IARC funding strategy reviewed (including core and project-specific funding balance) for period from 2005–06	Board of Management signed off on new funding framework for 2005–06 through 2007–08 at BOM Meeting 97. Framework outlines core funding categories and allocation of project-specific funding

Position

ACIAR is responsible for administering, on behalf of the Australian Government, Australia's contribution to the international agricultural research centres (IARCs). The IARCs are internationally funded, independent, non-profit institutions that carry out research and related activities to help achieve sustainable food security and reduce poverty in developing countries. Research-related activities cover agriculture, forestry, fisheries, policy and environmental management.

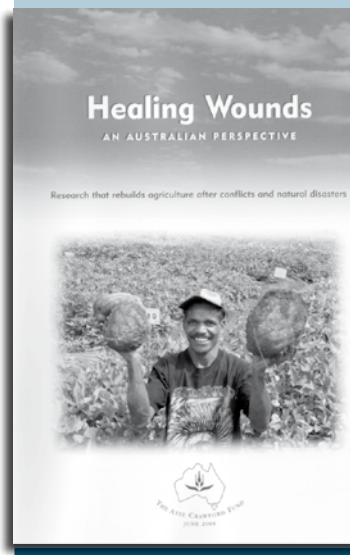
The goal of ACIAR's multilateral program is to ensure the effectiveness of, and benefits to, developing countries and Australia from agricultural research conducted by the IARCs with funds provided by Australia.

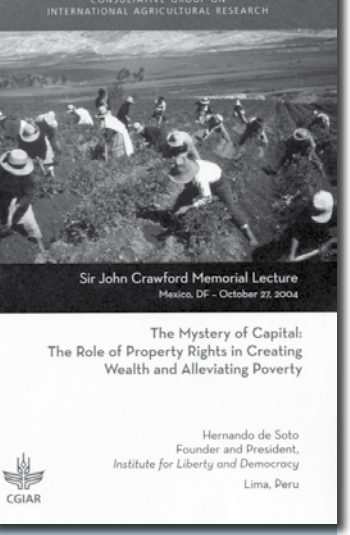
ACIAR's policy position for contributions to the IARCs involves:

- allocating around 20 per cent of ACIAR's total appropriation to the IARCs,
- allocating between one-third and half of ACIAR's annual IARC investment as project-specific funding, and
- focusing its unrestricted (non-project specific) funds on a reduced number of centres, based on comparative research advantages.

Disbursement of multilateral funds, 2004–05

In 2004–05 unrestricted contributions amounted to 55 per cent of funding allocated to IARCs. Project-specific funding accounted for 44 per cent, with the remaining one per cent of total multilateral research funding allocated to other multilateral activities. Of the 14 IARCs receiving funding, 13 received core funding (untied to specific projects). The allocations are based on the comparative advantage of individual IARCs to deliver research applicable to Australia's regional priorities. Of the 13 centres receiving core funding, five are located in the Asia-Pacific region and another six have a mandate that covers staple crops in the region. The remaining two, CAB International (CABI) and the International Food Policy





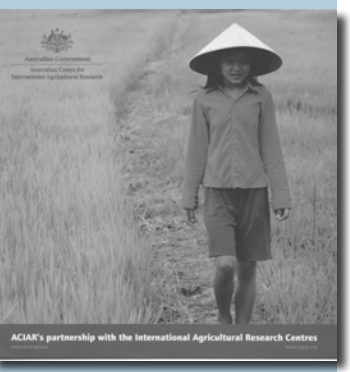
Research Institute (IFPRI), are responsible for research information systems and food policy respectively.

Thirteen funded centres received project-specific funding through ACIAR this year. Twelve of the centres are associated with the Consultative Group on International Agricultural Research (CGIAR), while one (CABI) works in an area of agricultural development of particular interest to Australia.

Project-specific research funding is designed to build tripartite research linkages, which allow scientists from IARCs, advanced research institutions in Australia and national agricultural research institutes in developing countries (particularly those that are ACIAR bilateral partners) to interact on specific issues. Projects developed under project-specific funding arrangements operate as part of ACIAR's 11 discipline-based research programs. IARC projects complement and add value to the bilateral programs run by the discipline areas. Seven new activities were initiated and four completed in 2004–05. A total of 26 projects, including these, were active in 2004–05.

ACIAR also supports relevant CGIAR system-wide initiatives. These are cross-centre programs that link research complementarities of different centres to address and resolve global and regional issues through strategic research approaches.

Other activities supported include the Asia-Pacific Association of Agricultural Research Institutions (APAARI) and the Crawford Memorial Lecture at the CGIAR Annual General Meeting.



During 2004–05 the ACIAR Board of Management endorsed new arrangements for funding IARC centres and projects, to apply from 2005–06 through to 2007–08 inclusive. Allocations of core funding to centres will continue to focus on those with a mandate relating to, or a geographic emphasis on activities in, the Asia-Pacific region.

The allocation of project-specific funding to an IARC and, where appropriate, Challenge Programs of the CGIAR will be considered annually on a competitive basis, where projects are selected on the basis of:

- relevance to ACIAR's country priorities;
- impact focus;
- networking with the National Agricultural Research Systems in ACIAR partner countries and with Australian research agencies;
- justification, scientific merit and consideration of equity amongst IARCs.

Project examples

An **International Potato Centre** project is enhancing the quality of pigs grown in sweet potato–pig livestock systems in Papua, Indonesia through the introduction of improved sweet potato varieties. Seven superior varieties have been identified. Pigs fed the improved varieties are growing faster. Trials under way at locations in eastern Indonesia

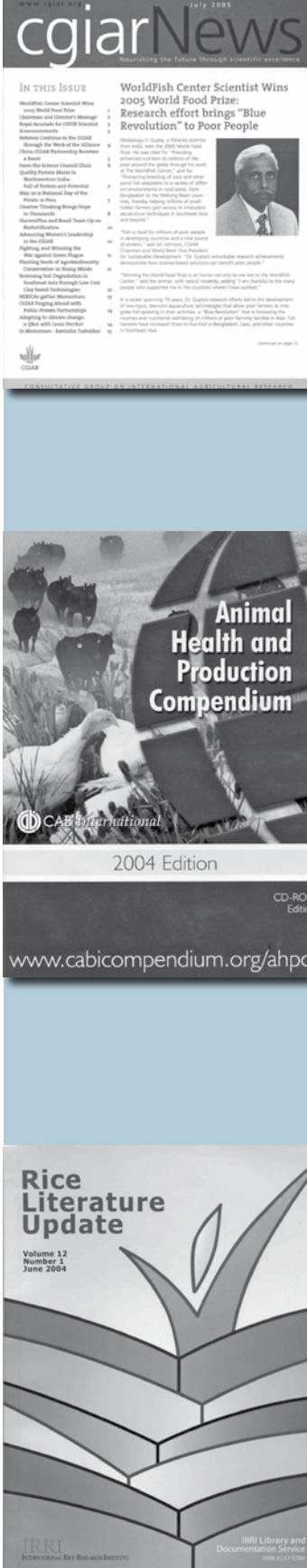
link to International Potato Center trials elsewhere in the country. The improvements to dietary composition as well as better husbandry have opened up opportunities for smallholders to fatten pigs in less time, allowing more sales throughout the year.

Crop–livestock systems provide ruminants with a major component of their diets. Cattle are fed crop residues, but little attention is paid to the nutritional value or quality of these residues. ACIAR is working with the **International Crops Research Institute for the Semi-Arid Tropics** (ICRISAT) to support the introduction of improved millet varieties. A newly commenced project is determining the value of the millets as cattle feed and the extent of their varietal adaptation, in order to enhance both the crop and livestock components of cattle–crop farming.

CABI is compiling an electronic, CD-ROM-based compendium detailing the results of extensive research pertaining to aquaculture industries—supported by ACIAR and other organisations. The compendium provides the aquaculture industry with text, pictures, maps, databases, diagnostic information and taxonomic keys, along with statistics, allowing easy retrieval of a range of information.

ACIAR is supporting a sustained research effort, led by the **International Rice Research Institute**, to develop apomictic hybrid rice. Apomixis is the naturally occurring ability of some plant species to reproduce asexually—plants growing from these seeds are identical to the mother plant. If new high-yielding hybrids could be reproduced asexually it would overcome the high cost and inflexibility of hybrid seed production. Molecular studies have discovered three fertilisation-independent seed (FIS) genes in *Arabidopsis thaliana*. This has led to the isolation of related genes performing the same function in different rice varieties. Transgenic lines of rice using one of the three FIS genes are now available.

The **International Food Research Policy Institute** works on projects relating to the changing global trade environment. One project is examining the implications of WTO accession for China's rural poor. While the eastern and coastal provinces of China are benefiting from global trade links, poorer farmers in the country's west may not reap the same rewards. Based on earlier studies IFPRI and ACIAR are analysing the impact of WTO accession on smallholders and offering policy options, particularly in public investment, to achieve economic growth and reduce poverty. A second project, involving IFPRI is investigating such implications on a broader-economic scale, assessing agricultural policies and levels of protection (or non-protection) for selected developing countries. Researchers now know what policies led to protection and non-protection of agriculture in India and China, and have disseminated their findings widely, including to the FAO. The impact of sanitary and phytosanitary measures on the ability of (agricultural exporting) developing countries to achieve the full benefits of trade liberalisation is also being addressed.

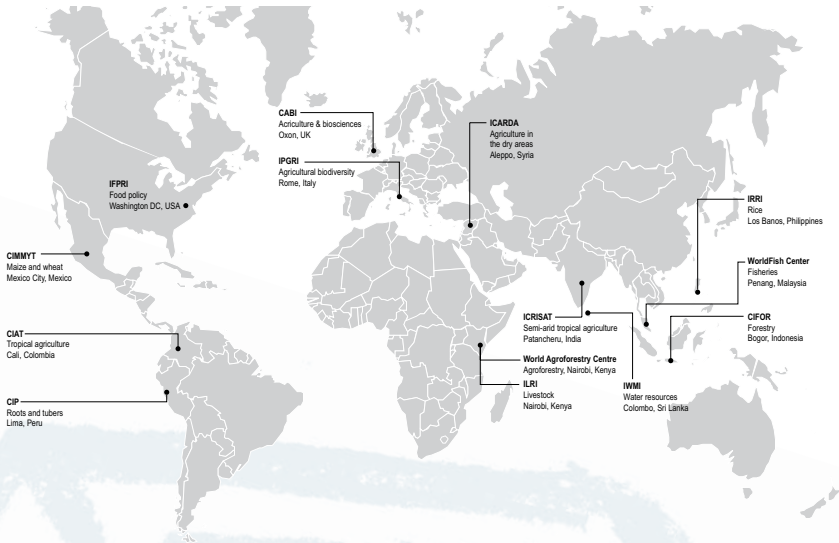


Power of partnerships

Helping villagers in Solomon Islands to sustainably utilise sea cucumber is the subject of a **WorldFish Center** project. Overfishing has threatened populations which, once depleted, take decades to recover. WorldFish is adopting a community-based approach to assist communities to optimise returns without depleting resources.

The *Seeds of Life* project is an excellent example of the assistance that an ACIAR-CGIAR project can provide to boost food production in a fledgling nation—in this case East Timor. ACIAR, together with five CGIAR centres (**CIAT, CIMMYT, CIP, ICRISAT and IRRI**), the Timorese Ministry of Agriculture and Catholic Relief Services established a project to assess many varieties of crops derived from their respective genebanks for suitability to local growing conditions. The project has helped improve food security through the introduction of high-performing, well adapted varieties of staple crops—maize, rice, sweet potatoes, beans, cassava and peanuts.

Location of International centres receiving core funding from ACIAR



Funding to IARCs for 2004–05

Acronym	Centre title and location	Core funding (A$)	Project-specific funding (A$)	Total (A$)
Centres associated with CGIAR				
CIAT	International Center for Tropical Agriculture, Colombia	0	150,000	150,000
CIFOR	Center for International Forestry Research, Indonesia	300,000	100,000	400,000
CIMMYT	International Maize and Wheat Improvement Center, Mexico	700,000	510,000	1,210,000
CIP	International Potato Center, Peru	330,000	200,000	530,000
ICARDA	International Center for Agricultural Research in Dry Areas, Syria	250,000	720,000	970,000
ICRISAT	International Crops Research Institute for the Semi-Arid Tropics, India	550,000	240,000	790,000
IFPRI	International Food Policy Research Institute, United States of America	450,000	360,000	810,000
IITA	International Institute of Tropical Agriculture, Nigeria	0	0	0
ILRI	International Livestock Research Institute, Kenya	300,000	0	300,000
IPGRI	International Plant Genetic Resources Institute, Italy	300,000	390,000	690,000
IRRI	International Rice Research Institute, Philippines	850,000	450,000	1,300,00
IWMI	International Water Management Institute, Sri Lanka	500,000	400,000	900,000
World Agroforestry Center	World Agroforestry Centre, Kenya	250,000	310,000	560,000
WorldFish Center	WorldFish Center, Malaysia	450,000	330,000	780,000
Centre not associated with CGIAR				
CABI	CAB International, United Kingdom	300,000	210,000	510,000
Total funds to IARCs		**5,530,000**	**4,370,000**	**9,900,000**

Sharon Harvey, Education and Training Officer

Building research capacity

AOP budgeted expenditure in 2004–05	$2,400,000
Actual expenditure in 2004–05	$2,565,098
Expenditure in 2003–04	$2,465,634
Expenditure in 2002–03	$2,513,554
Proportion of total ACIAR expenditure 2004–05	**5.0%**

Key performance indicators	Performance 2004–05
• Training on experimental design and analysis successfully run in three countries	Courses covering experimental design and analysis, quality control and assurance run in Vietnam, Papua New Guinea and Indonesia (including courses related to tsunami rehabilitation in Indonesia)
• JAF follow-up survey identifies at least 10 former fellows whose ACIAR-sponsored studies significantly benefited their home country	11 former fellows are now working at either Director or Deputy Director level in their group/institution 78 per cent of former fellows returning to work in home country have been promoted 61 Directors of research institutions in 16 countries agreed that former fellows employed under them had passed on research skills and knowledge
• At least eight students successfully complete postgraduate studies	10 JAFs successfully completed postgraduate studies and returned to home country

Position

The training program builds the research capacity of agricultural research institutions in partner countries through the provision of discipline-specific and broader training opportunities. ACIAR conducts several specific training initiatives, the John Allwright fellowships, John Dillon fellowships and short-term cross-program courses.

Project-specific training

ACIAR only supports training that relates directly to its projects. Program activities focus on formal training provided through fellowships and courses targeting specific issues. The majority of training provided by ACIAR takes place within individual research projects; these opportunities are not included in the budget figures shown above. Training managed and funded by the ACIAR training program falls into four categories, the first representing the main expenditure:

- postgraduate fellowships (John Allwright Fellowship Scheme);
- research management training (John Dillon Memorial Fellowship);
- short-term cross-discipline training courses for developing-country staff involved in ACIAR projects;
- training courses provided through the Crawford Fund for International Agricultural Research for project staff on ACIAR-funded projects.

Formal courses may be built into the project—for example to provide training in a particular research methodology or use of new equipment—and often develop essential skills in computing or scientific communication. Informal training varies according to the type of project, the ability of the project team and opportunities that arise. There is a particular emphasis on providing postgraduate and short-course training for ACIAR project scientists from Papua New Guinea, the Pacific Islands, poorer regions of Indonesia, East Timor, Cambodia, Vietnam and Laos.

John Allwright Fellowships

John Allwright Fellowships are awarded to developing country project scientists who are or have worked on an active ACIAR project. The Fellowship involves support to undertake Masters or PhD training at Australian universities in a theme related to the project in which the awardee is engaged. Studies do not directly form part of the project. In 2004–05, $1.56 million was expended on the John Allwright Fellowship Scheme with 52 active fellowships, representing 14 countries. Ten fellows successfully completed their studies during the year while one student did not due to medical reasons. Eight candidates, from East Timor, Indonesia, Papua New Guinea, Philippines and Vietnam, commenced at seven universities in Australia. Each year a group of Fellows spend a week visiting ACIAR headquarters, where they receive training in science communication, writing research papers and other activities.

A publication entitled *The Impact of the John Allwright Fellowship Scheme—Survey Report* was produced in September 2004. The major findings indicated the success of John Allwright Fellows is very high—91 per cent of fellows have completed the higher degree. More than three-quarters of the fellows are working in a relevant position in their home country with 80 per cent working for the employer who released them to undertake the ACIAR fellowship. Seventy-eight per cent have been promoted within their organisations since receiving a qualification.

Returnee small project awards

ACIAR provides grants of up to $10,000 for John Allwright Fellows who, after completion of their postgraduate studies, have returned to relevant employment in their home country. The grant is aimed at developing small-scale research projects in the returnee's institution that are related to the research done within an ACIAR project associated with postgraduate work. Such grants may catalyse longer-term support. In 2004–05 seven small projects totalling $65,640 were awarded.

John Dillon Memorial Fellowship

The John Dillon Memorial Fellowship provides a career-development activity for a small number of outstanding partner-country agricultural scientists or agricultural economists actively involved with ACIAR projects. Leadership skills in agricultural research management, agricultural policy and/or extension technologies are developed through exposure to Australian best-practice organisations involved in these areas. Programs are tailored to meet the needs of individual Fellows.

Six John Dillon Fellows (from China, India, Indonesia, Papua New Guinea, and Philippines) visited in February–March 2005, each for approximately five weeks. This was the third group to be awarded Fellowships. Minister Downer again met with the Fellows at Parliament House for a discussion about their training and presented them with individual plaques. Expenditure for the year was $101,034.

Australian Youth Ambassadors for Development

ACIAR provides assignments for Australian Youth Ambassadors for Development (AYADs), an AusAID-funded scheme involving young Australians in a development activity in a partner country for between three and 12 months. Twelve Youth Ambassadors were assigned to ACIAR projects in developing countries during 2004–05, and seven of these have completed their assignments. Three AYADs worked in the Philippines, one was based in China, two were involved in projects in Vietnam and another worked in Cambodia.

At the end of June 2005 there were five active Youth Ambassadors. Two are based in western China on a project to improve the productivity and sustainability of farming systems in Gansu Province. In Vietnam two are assigned to a project on the use of high-value trees for timber production and enhanced community services. One is based in Cambodia at the Cambodian Agricultural Research and Development Institute, assisting with communication and publicity activities.

ACIAR John Dillon Fellow, Dr Harminder Singh Sidhu receives a commemorative award from Minister for Foreign Affairs, Alexander Downer

ATSE Crawford Fund fellowships, courses and master classes

ACIAR administers an Australian Government allocation of $650 000 to the ATSE Crawford Fund. In 2004–05, total funding through ACIAR was $766,321, with $116,321 funding for joint training activities provided as well as the Australian Government allocation. The Fund also attracted contributions from State Governments and the private sector. In 2004–05 the Fund conducted short-term training activities associated with ACIAR projects, including:

- a Master Class on Soilborne Pathogens of Wheat with 21 participants from grain-growing areas throughout China (Henan Agricultural University, China);
- Developing expertise in the management of cocoa diseases in Vietnam—2nd workshop July 2004 and 3rd workshop June 2005 (both at University of Sydney);
- Construction and training for use of reduced tillage equipment in Cambodia (NSW Department of Primary Industries);
- Biological control of tropical weeds for participants from Fiji, Thailand, Papua New Guinea and Kenya (CSIRO Entomology, Indooroopilly, Queensland); and
- Assessing forest and savannah resources in eastern Indonesia (Charles Darwin University).

These classes and workshops allow ACIAR research results to be more widely applied in developing countries, by including scientists from countries other than those where their projects are situated. The Fund also sponsors short-term training fellowships, and in 2004–05 sponsored six fellowships for members of ACIAR project teams, enabling them to undertake training in Australia for up to three months.

Cross-program training

ACIAR conducts cross-program training courses on the priority topics of:

- research management and scientific priority-setting;
- intellectual property management in agriculture;
- research methodology, including experimental design and data analysis;
- research proposal writing, and scientific report and paper writing in English;
- economics for biophysical agricultural scientists;
- agricultural extension principles;
- research monitoring and evaluation.

The following cross-program training courses were undertaken:

- *Quality Assurance and Quality Control in an analytical laboratory* (Ho Chi Minh City, Vietnam, November 2004)
  A five-day workshop on quality assurance and quality control in an analytical laboratory, facilitated by Queensland Department of Natural Resources and Mines and involving senior laboratory technicians from Vietnam, Laos and Cambodia.

- *Research management and priority-setting* (Lae, PNG, April 2005)
  The fourth in a series of six-day training workshops on research management in agriculture presented by the University of New England was held for 24 senior PNG scientists.

- *Research management and priority-setting* (Los Baños, Philippines)
  This course was the fifth in the series of six-day training workshops on research management in agriculture.

- *Post-tsunami rehabilitation training workshops* (Medan and Batam, Sumatra, Indonesia, April and May 2005)
  Three courses (one in soil analysis for soil laboratory technicians, a second on crop and soil management for extension and research staff, and a third for field staff in aquaculture) were held as part of ACIAR's response to the tsunami crisis in Aceh. Attendees at the courses included staff from research organisations and universities in affected areas.

- *Research methodology, including experimental design and data analysis* (Lae, PNG, June 2005)
  A nine-day course in experimental design and sampling for PNG project scientists (building on an earlier course provided by the University of Canberra to ACIAR project staff in Bali, Indonesia in June 2004).

- *Scientific writing and journal editing* (Cambodia, May 2005)
  The training aims to assist in re-establishing the *Cambodian Journal of Agriculture*, an important vehicle for publication of research and extension information in Khmer and English, but which had lapsed at the completion of the Cambodia-IRRI Assistance Program in 2001–02.

- *Writing scientific papers in English* (Vietnam, June 2005)
  The first of two 12-day short courses for scientists involved in ACIAR projects in Vietnam, designed to assist in publishing results in international journals. Designed and delivered by the University of Western Sydney.

John Allwright Fellows visit ACIAR for training, October 2004

Lisa Wright, Manager Communications and Secretariat Unit

Communicating Research Outcomes

AOP Budgeted expenditure in 2004–05	$700,000
Actual expenditure in 2004–05	$776,556
Expenditure in 2003–04	$742,721
Expenditure in 2002–03	$702,225
Proportion of total ACIAR expenditure 2004–05	**1.5%**

Key performance indicators	Performance 2004–05
• Evidence of continuing demand for and appreciation of ACIAR publications	6219 hard copies of publications disseminated in response to 2120 individual requests. 95 of these were sales requests that led to sale of 466 copies. 171,446 copies of ACIAR scientific publications were downloaded from the website by 19,858 separate visitors. 60,997 downloaded were ACIAR scientific publications released in 2004-05, downloaded by 5655 separate visitors.
• Targeted stakeholder groups are satisfied that their information needs are being met	Country profiles distributed to government, research and NGO sector stakeholders in Australia and partner countries. Information and displays provided at two international and two Australian conferences.
• ACIAR's use of ICTs in disseminating agricultural research information for development is consistent with current best practice	>430,000 visits to the ACIAR website over the year, by >300,000 separate visitors The number of daily visits increased by 47per cent over the year (from 960/day in July 2004 to 1400/day in June 2005) All new publications in soft and hard copy CD-ROMs supplied with two new titles Links to ACIAR resources on the Agriculture pages of the Australian Development Gateway

Position

ACIAR communicates the results of the research it funds to a wide range of stakeholders, mainly through its website and its hard and soft copy publications. It also undertakes a program of targeted awareness to make known the outcomes and impacts of research. The scientific publishing program links research and adoption through the provision of low-cost access to syntheses of information from ACIAR-funded projects or activities. Customised information resources and briefing materials support communication activities of our staff and portfolio partners. Our partnership with the Australian Development Gateway provides another avenue for linking our outputs with the broader development community.

The Communications Program assists Centre staff with developments in the use of information and communication technologies (ICTs) to transmit agricultural research information. ACIAR's website is the primary source of information as well as access to publications; materials are also supplied in traditional hard copy form and on CD-ROM. Translations into regional languages and use of multimedia technology are also supported where appropriate.

Achievements

During 2004–05 ACIAR published and distributed 15 new titles in its scientific series (eight monographs, four proceedings and three technical reports), and eight reports in its impact assessment series. These are listed in Appendix Four, together with the corporate and research awareness titles produced during the year.

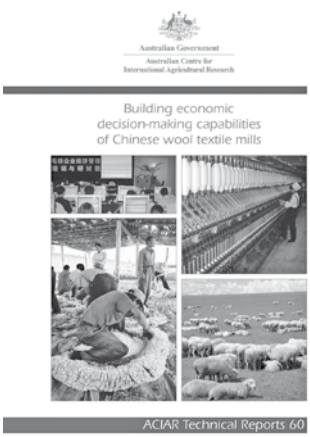
One monograph contains policy briefs on key agricultural and rural development issues facing China in the early 21st century. It addresses issues of food security, trade liberalisation and poverty, grain marketing and grain-reserve management reform, raising farm productivity, and the environmental impact of rural development.

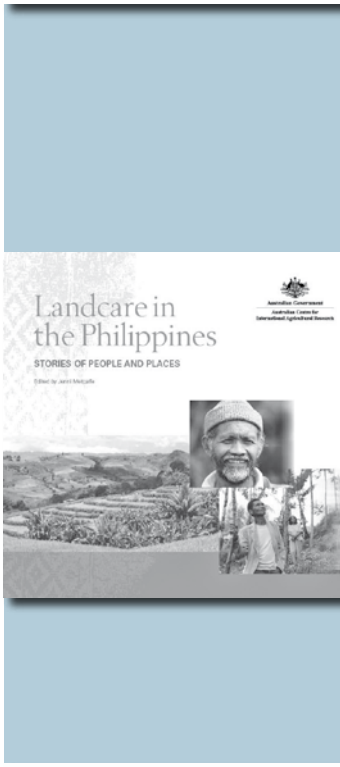
A manual on safer selection and use of pesticides includes practical guidance for risk assessment and management of pesticides, as well as a series of Vietnamese case studies on hazard identification and risk management in the field.

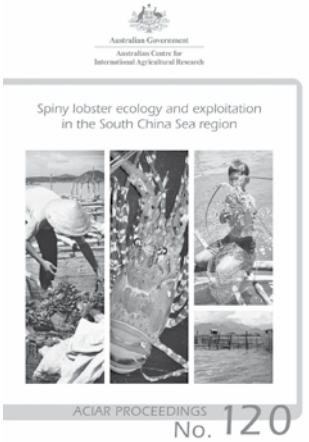
The stories of those involved in implementing conservation farming in Mindanao (farmers, community leaders, government officials, researchers and facilitators) are told in *Landcare in the Philippines* (Monograph 112). The results of 20 years of research on the versatile tropical legume *Stylosanthes*, and its use in smallholder and commercial farming systems, are summarised in another volume. *Nitrogen Fixation in Acacias* (Monograph 115) reviews current knowledge of methods to enhance and exploit the relationship between acacias and root-nodulating bacteria to increase soil nitrogen.

Another publication draws together information on control of parasitic worms in sheep and goats in the Asia-Pacific region. The book describes a range of control options practised in countries across the region, and explains how to extend knowledge of control options to smallholder communities. The accompanying CD-ROM provides additional previously unpublished text and resources.

More than 35,000 hard copies of publications were distributed, of which 466 were sold to developed world customers, earning net income of $12,621. Complimentary copies were distributed on request to 2120 people and institutions involved in agricultural research, development and extension. Records show that 19,848 individual visitors downloaded 171,446 part or full copies of publications from the ACIAR website. The most popular hard copy titles were *Diversity and Management of Phytophthora in Southeast Asia* (Monograph 114), *China's Agricultural and Rural Development in the Early 21st Century* (Monograph 116), *Control of Newcastle Disease and Duck Plague in Village Poultry* (Proceedings 117) and *Production Technologies for Low-Chill Temperate Fruits* (Technical Report 61), while the most frequently downloaded titles included *Advances in Grouper Aquaculture* (Monograph 110), *Lantana: Current Management Status and Future Prospects* (Monograph 102), *Agriproduct Supply-Chain*







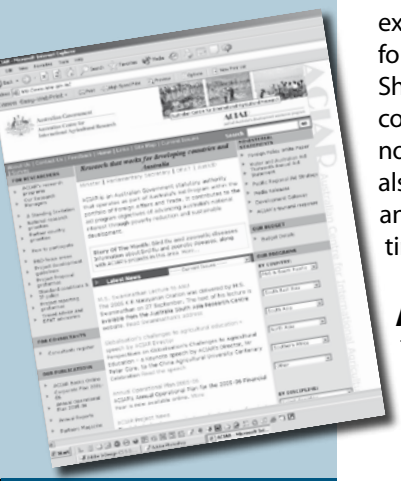
Management in Developing Countries (Proceedings 119) and *Trials of Cold-tolerant Eucalypt Species in Cooler Regions of South Central China* (Technical Report 57).

The quarterly magazine *Partners in Research for Development* continued to attract favourable attention from Australian and overseas recipients. ACIAR's work in Cambodia, Laos, Papua New Guinea and China was featured during the year, in addition to programs and projects tackling animal health, sustainable fisheries, trade-related issues and capacity-building activities.

A series of Country Profiles, produced for the first time in 2004–05, was well received by stakeholders. The Profiles brought together a current overview of ACIAR's program with each country or region, together with summaries of active and recently concluded projects.

As part of Australia's commitment to increase use of ICTs to help bridge the digital divide, ACIAR has supported the transfer of technology developed at the University of Queensland's Centre for Biological Information Technology to the Philippines Rice Research Institute (PhilRice) extension services group and to IRRI's training centre. The technology consists of a tool that facilitates development of problem-based learning (PBL) resources in an interactive, online format. The outputs are five scenarios based on problems that local extension workers would encounter in their daily work with rice farmers. The resources are now being used in the pilot implementation of a Philippines Government initiative, the Open Academy for Philippine Agriculture, which uses ICTs to provide extension officers in local government units with better access to up-to-date agricultural information.

In another initiative, the use of low-cost, low-bandwidth videoconferencing technology and off-the-shelf internet conferencing tools to link project teams is being trialled in Australia, Indonesia and South Africa. The aim is to increase the level of interaction and information exchange between the partners without increasing the frequency of expensive face-to-face meetings, and eventually to use these technologies for interaction with farmers as well. An early, unexpected finding is that Short Message Service (SMS) is the preferred means of non face-to-face communication among many Indonesians. Australian team members are now using SMS as a key communication channel. Distant collaborators are also using combined phone and internet hook-ups to plan experiments and conduct simulations through a shared computer interface, in real time.



ACIAR's Website

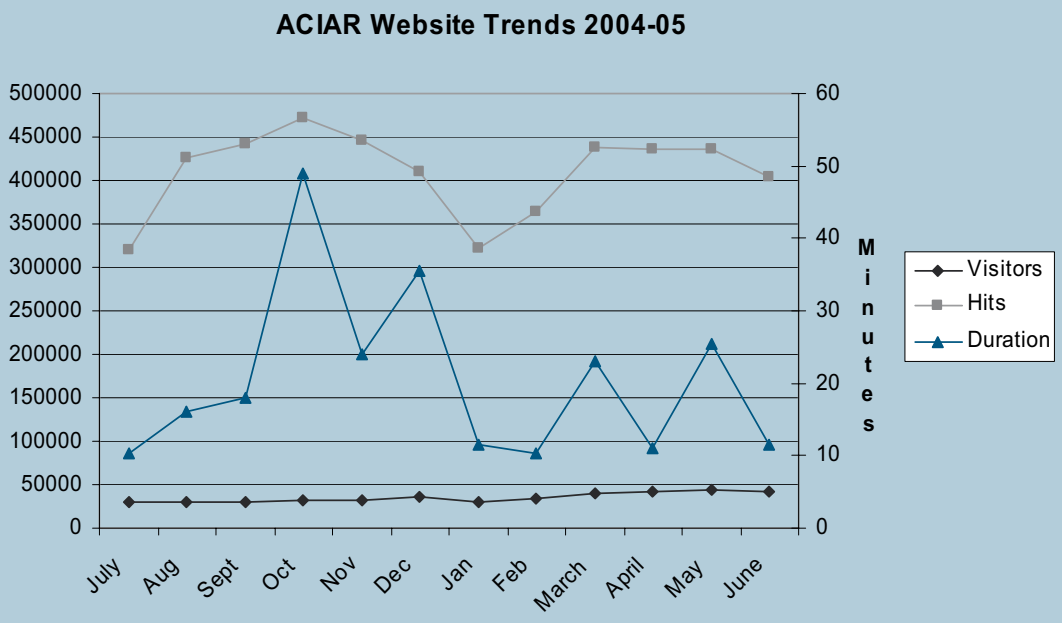
The ACIAR website (www.aciar.gov.au) is a first-stop gateway into the Centre's operations and activities. Information on current and concluded projects, ACIAR planning and reporting documents and Australian and international partners is included on the site. During

2004–05 the ACIAR Online bookshop was developed, offering researchers, end-users and interested visitors access to all available electronic scientific publications, and the facility to purchase hard copies in a secure environment.

Each publication page includes a summary of the content, pricing and author details. Electronically available publications are included as attached PDF files.

Analysis of website visitor and download statistics reveals increases in trends for visitors, downloading of publications and hits, along with the time spent visiting the site. Feedback reveals that very few visitors cannot find the material they are seeking.

The chart shows the number of visitors to the site and the number of hits, both along the left hand axis. The right hand axis relates to the time each visitor spent on the site.



Jeff Davis, Policy Linkages and Impact Assessment

Measuring Research Impacts

AOP budget expenditure 2004–05	$460,000
Actual Expenditure 2004–05	$408,624
Expenditure in 2003–04	$439,026
Expenditure in 2002–03	$228,685
Proportion of total ACIAR expenditure 2004–05	**0.8%**

Key Performance Indicators	Performance 2004–05
• Four to six assessments of completed projects will be commissioned and published in 2004–05	Seven assessments were published including three commissioned in 2003–04. An extra working paper with qualitative assessment was also published on the ACIAR website. Reports from another three commissioned studies will be published in 2005–06.
• A meta-analysis of impacts of ACIAR's investment in agricultural R&D will be undertaken	Benefit-cost meta-analysis of bilateral investments by ACIAR was completed and subjected to external peer review.
• Impacts and lessons learnt from ACIAR agricultural development policy research in three or four major countries will be evaluated to guide future investments	A generic review of ACIAR's research on agricultural policy, including a framework for assessing future projects, was published (IAS31).
• Adoption studies of projects concluded in 2000–01 will be commissioned	Ex-post adoption studies were undertaken for 11 projects completed in 2000–01.

Position

ACIAR has a significant investment in impact evaluation, managed by the Impact Assessment Unit (IAU). How to demonstrate the effectiveness of projects and the impacts arising from them remains a challenge common to aid donors. Agricultural research administrators, funders and policy decision-makers have an increasing interest in measuring the economic benefits from agricultural research and development. In addition to economic returns the questions of measuring poverty reduction, along with social and environmental benefits, are areas where refinement is needed.

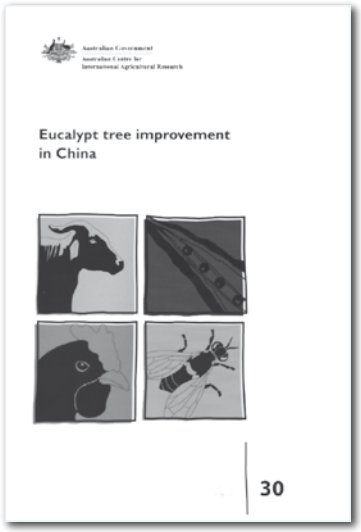
Based on this experience and through partnerships with agencies in Australia and overseas, the Centre has both refined and enhanced its methods and measures of R&D performance. This ongoing scrutiny has resulted in improved evaluation methodology to provide both quantitative and qualitative assessments of individual R&D investments and expenditure on project portfolios. In all of these evaluation exercises an increased emphasis on community impacts, poverty reduction and capacity-building, both in Australia and overseas, has been incorporated. The range of assessments utilised by ACIAR in 2004–05 has included:

- **project reviews** undertaken before the end of the project by independent experts to assess project performance against objectives,
- **adoption studies** undertaken three years after the completion of any project in which investment exceeded $400,000, and for which there were no follow-on projects. These studies are designed to highlight the level of uptake of project results;

- **economic impact assessments** undertaken once project results have been taken up by end-users. Assessments measure returns on investments;
- **thematic studies/meta-analyses** examine returns on ACIAR's investment in specific thematic research areas and the returns to the Centre's overall investment in partner countries and Australia. The information obtained assists in shaping future investment patterns.

Achievements

Eucalypt tree improvement in China



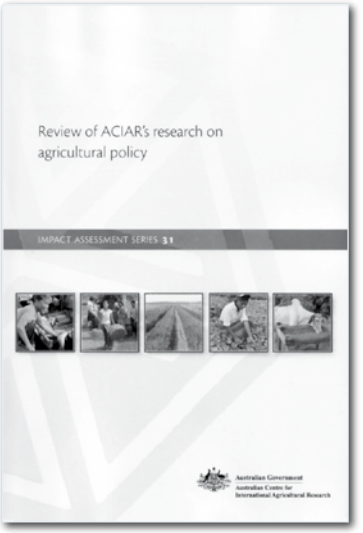
Since 1985 ACIAR has funded seven projects valued at $12 million, (equivalent to $18.2 million in today's dollars) on the development of plantations of high-yielding *Eucalyptus* trees in China. These projects have focused on three main areas: genetic improvement; silviculture (management techniques); and investigations of the sustainability of eucalypt plantations. CSIRO Forestry and Forest Projects, the Victorian Department of Sustainability and Environment and Murdoch University worked in collaboration with the Chinese Academy of Forestry. A recent impact assessment found that the ACIAR-funded projects played a central role in delivering the productivity improvements that now underpin this industry and have been partly responsible for prompting the rapid expansion in plantation area.

The total research effort in China, including China's own projects, is estimated to generate a net present value (NPV) of $1.3 billion over a 30-year period (1985 to 2015). Benefits exceed research costs by a ratio of 57 to 1. Sensitivity analysis indicates that NPV returns may range from $669 to $2148 million, reflecting the uncertainty associated with key parameters. Not all these benefits are attributable to the ACIAR-funded research. However, the investments made by ACIAR and its collaborators account for 78 per cent of total research costs, suggesting a significant proportion of benefits may be attributable to these projects. In terms of poverty reduction no hard data are available, but the research has almost certainly made a considerable contribution to improving the living standards of rural people in southern China. The assessment was published as Impact Assessment Series No. 30.

Analysis of ACIAR's investment in policy research

In 2004 ACIAR commissioned a review of the balance and directions of ACIAR's investment in policy research. While the policy projects have a narrower range of benefits, and do not seem to have some of the

very high values that are apparent in technical projects, this may be simply because there are fewer policy project estimates. The available evidence from ACIAR research suggests that policy projects are just as likely as technical projects to give very good returns. Estimates of policy project returns suggest benefit-cost ratios vary from 4.5:1 to 60:1. In contrast, benefit cost ratios from previously assessed technical projects varied from 1.7 to 180:1.



The review also found ACIAR's policy project portfolio was very successful, noting in particular:

- advantages of ACIAR's collaborative approach to research that resolve ownership issues at the outset of research;
- ACIAR's relatively low administrative overheads approach to procurement, factors that make it easier for project partners to work effectively;
- clear gains resulting from ACIAR's ability to develop long-term relationships with both Australian and partner country researchers.

The review produced eight recommendations for improvement which have been considered by the Board of Management with most accepted as a basis for future action. This thematic study/meta-analysis was published as ACIAR Impact Assessment No. 31.

Shelf-life extension of leafy vegetables

China is the world's largest producer of vegetables, and the industry is rapidly expanding. Postharvest losses of leafy vegetables in China, however, have been between 10 and as high as 25 per cent. Conservative estimates place these annual economic losses at A$1 billion. From July 1998 to December 2002 ACIAR funded a project, *Shelf-life extension of leafy vegetables*, to reduce postharvest losses. In addition to identifying postharvest problems in China and making a series of breakthrough findings on the factors affecting vegetable shelf life, some practical techniques, such as forced-air pre-cooling, improved postharvest handling systems, controlled water loss and rehydration, and modified atmosphere packaging, were developed and have been widely applied in China and Australia.

The evaluation of Chinese benefits focuses on Beijing and Zhejiang, the two regions that have adopted the new techniques, while in Australia the evaluation focuses on the adoption of modified atmosphere packaging of leafy Asian vegetables in the fresh-cut industry. The evaluation reveals large benefits to Chinese vegetable growers and distributors—a significant achievement given the fact that the project was completed only 2 years ago. Over a period of 30 years from 1998, the net present value (at a 5 per cent discount rate) of the project to China is A$149.8 million, or RMB 912.5 million. Australian vegetable growers and distributors also benefit from the project, receiving a net present value of A$1.6 million. The benefit-cost ratio is 40:1 when combined benefits and costs are measured in Australian dollars. This was published as ACIAR Impact Assessment No. 32.

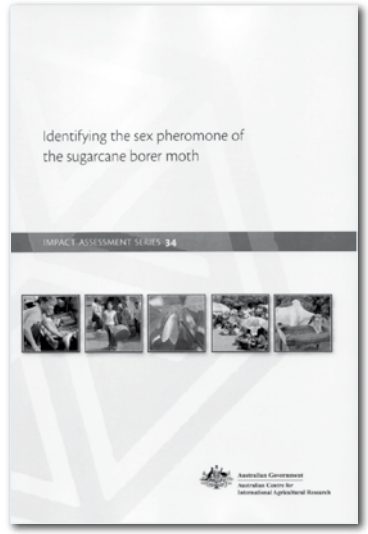
Research into conservation tillage for dryland cropping in Australia and China

This report contains an economic impact assessment of two ACIAR-funded projects; *Conservation/zone tillage research for dryland farming*, and *Sustainable mechanised dryland grain production*, covering a decade from 1993-2003. The projects focused on the development of improved technologies for controlled-traffic farming (CTF) in dryland crop production in Australia, and on reduced or conservation tillage (CT) for similar purposes in China. Using the methods of economic surplus and stochastic benefit-cost analysis for a 30-year period, the assessors estimate that the projects have the potential to deliver substantial long-term benefits. The Australian benefits are estimated as increments to the past volume of CTF research. The net present value and benefit-cost ratios estimated are deemed to be the 'most likely' (the median in the case of net present value). For wheat production, the net present value of project benefits is estimated to be $79.5 million and the benefit-cost ratio is 4.9:1.

The benefits to China are also incremental and are estimated to be much larger than those for Australia, because of the greater scale of wheat and maize produced in China. Also, the innovative nature of the CT research during the projects in China means that its benefits are more readily attributable to the ACIAR-funded projects. Considering Chinese wheat production, the net present value of project benefits is estimated to be $408.5 million and the benefit-cost ratio of 25.7:1, while the values for maize production in China are $90.6 million and 5.7:1. The estimated total economic benefits of the project are a net present value of $578.6

million and benefit-cost ratio of 36.3:1. This estimate of returns to research might seem large but, based on the price and quantity of data used in this assessment, it amounts to only about 1.3 per cent of the average annual gross value of the relevant crop production in Australia and China between 2000 and 2003. This impact assessment was published as ACIAR Impact Assessment No. 33.

Identifying the sex pheromone of the sugarcane borer moth



The cane borer *Sesamia grisescens*, the larva of a species of moth, has been a major cause of sugarcane losses in PNG. Ramu Sugar, PNG's commercial sugar producer, has developed an integrated pest management strategy (IPM) to deal with the problem. While apparently reducing the level of attack, the strategy was unable to achieve a high level of control of the borer. A major addition to the IPM strategy was the introduction of sex-pheromone-baited traps to capture moths in flight and use information on moth numbers to schedule spraying. The research that led to the identification of the pheromone for use in the traps was partially funded by ACIAR. The most reliable of these benefit-cost estimates are those for the benefits to date which (at the mean) generate a very healthy benefit-cost ratio of 20:1. For relatively low expenditure the pheromone trap method appears to have significantly reduced costs and damage.

The assessment showed that the present value of cost-benefits of the research is significant, ranging between $4 million and $25 million over a 30-year time frame, with a benefit-cost ratio between 46:1 and 266:1. As the research relating to the use of the trap was funded by CSIRO and Ramu Sugar as well as ACIAR, it may not be appropriate to attribute all the benefits to ACIAR, but without ACIAR funding there is a significant chance that the project would not have taken place. This impact assessment was published in ACIAR's Impact Assessment No. 34.

Results of a social and economic impact assessment of integrated pest management strategies in Brassica vegetable crops in China

ACIAR has also funded environmental and resource-management research projects in China. Among these, the ACIAR-funded projects on *Improvement of integrated pest management (IPM) of Brassica vegetable crops in China and Australia* were implemented with significant success. In 2000, ACIAR supported the Center for Integrated Agricultural Development (CIAD), China Agricultural University, to carry out a study entitled *Household impact analysis of adoption of IPM strategies in Brassica vegetable crops in China*. The main objective was to identify the direct effects of IPM strategies on household decision-making processes and

to determine the factors that affect grower adoption of IPM. The study focused mainly at the household level and concentrated in Hangzhou, one of two pilot areas for the ACIAR projects.

The purpose of the assessment reported here (Impact Assessment Unit Working Paper 47) was to extend the earlier analysis by investigating the longer-term impacts of the ACIAR funded projects. Local partners report adoption of 642,000 mu (42,800 ha) between 2000 and 2002. In Wenzhou, the total vegetable growing areas where IPM was adopted reached 54,300 mu (ca 3600 ha) in the period from 2000 to 2002. About 28,000 IPM-related technical brochures and leaflets were produced and distributed to vegetable growers. In addition, more than 89 technical training courses were organised, during which more than 10,000 farmers received various types of technical training. The report's authors recommended several approaches to encourage farmers to adopt IPM and other environmentally sound cultivation techniques.