



BOTANY PARTNERS: The search for germplasm for plant breeders working on improved crop varieties requires a range of scientific disciplines and partnerships, from genetics through to agronomy and botany. ACIAR has been funding seed collection missions over the past decade to help the Consultative Group on International Agricultural Research gene banks preserve the genetic resources that are essential to future, sustainable agriculture. On a 2005 collecting mission in Armenia, Dr Clive Francis, from the Perth-based Centre for Legumes in Mediterranean Agriculture, caught up with internationally renowned botanist Professor Eleonora Gabrielian at the Institute of Botany, Armenia.

Working with the CGIAR

Sir John Crawford's role in the establishment of both ACIAR and the Consultative Group on International Agricultural Research has created close ties between Australia and aid efforts aimed at agricultural production and rural communities

BY WARREN PAGE

A global partnership for development is the eighth of the Millennium Development Goals. The partnership model, drawing together expertise and resources to tackle problems such as low levels of agricultural productivity, mirrors ACIAR's operational structure and that of the Consultative Group on International Agricultural Research (CGIAR).

The links between ACIAR and the CGIAR run beyond the partnership model. That both adopted this model is due in no small part to the late Sir John Crawford, who was active in the establishment of both the CGIAR and ACIAR.

The CGIAR, established in 1971, is a strategic partnership among 64 members who support 15 international centres that work in collaboration with many hundreds of government and civil society organisations as well as private businesses around the world. CGIAR members include 21 developing and 26 industrialised countries, four co-sponsors and 13 other international organisations. Today, more than 8,000 CGIAR scientists and staff are active in

more than 100 countries throughout the world.

The CGIAR centres and scientists provide the scientific R&D base needed to foster sustainable agricultural growth that benefits the poor through stronger food security, better human nutrition and health, higher incomes and improved management of natural resources. The new crop varieties, knowledge and other products resulting from the CGIAR's collaborative research are made widely available to individuals and organisations working for agricultural development throughout the world.

Under Section 5 of ACIAR's founding legislation, one of its functions is "to fund international agricultural research centres". The centres of the CGIAR and selected other non-aligned centres have received Australian Government funding through ACIAR since 1992.

However, Australia's involvement with the CGIAR goes back to its establishment in the early 1970s. Sir John Crawford, an Australian economist and passionate advocate of the role of international research to lift agricultural productivity, chaired the Technical Advisory Committee (TAC) of the CGIAR during its

establishment. Crawford's understanding of the link between increased agricultural productivity and poverty reduction helped shape the CGIAR. Professor Heinz Arndt wrote of Crawford's contribution in *The Economic Record* in 1985: "When Crawford vacated the TAC chair in 1976, he had the satisfaction of having helped to bring into existence a network of 13 research institutes covering all the more important aspects of food production technology in the Third World, including livestock, farming systems and food policy research."

While Crawford's role in the establishment and early days of the CGIAR was important, his advocacy and drive were pivotal to the establishment of ACIAR. A study committee chaired by Crawford produced the report that recommended to the Australian Government the establishment of a centre linking Australian scientific expertise with the needs of developing-country agriculture. ACIAR was the result of that report, which came to be known informally as the Crawford Report.

Almost three decades after its establishment ACIAR and the centres of the CGIAR are

working closely together to boost agricultural productivity.

Engagement between the CGIAR centres, the non-aligned international centres and ACIAR has focused on utilising their expertise to address specific problems holding back productivity in a number of developing countries.

There have been many success stories where the centres of the CGIAR and ACIAR have joined in partnership with developing-country scientists. Among these have been the introduction of improved crop varieties in East Timor, Iraq and Afghanistan, a suite of projects boosting fishing sustainability and productivity in the Pacific, progress towards the achievement of apomixis in rice, and improvements in cropping practices in southern Africa.

ACIAR's partnerships with the CGIAR also help deliver benefits to Australia. Agriculture in Australia cultivates species that are mostly not native to Australia, including wheat, pulses and legumes.

Independent economic assessments commissioned by NSW Agriculture and ACIAR of the value to Australian agriculture contributed by the International Maize and Wheat Improvement Center (CIMMYT) and the International Center for Agricultural Research in the Dry Areas (ICARDA) demonstrate direct and indirect benefits.

Australia's dependence on agricultural crops that are widely grown around the world means it is vulnerable to price fluctuations. Improved crop varieties introduced by research from the CGIAR flow throughout these growing regions, resulting in increased production and, with it, changes in price. When demand is low, price follows; when it is high, as was the case in 2008 with shortages of a number of food staples, prices rise.

CIMMYT's success in delivering improved wheat varieties has benefited both developed and developing world agriculture through increasing global wheat production. However, as supply has risen demand has fallen, taking world prices for wheat down with it. This fall has resulted in a 7.4% drop in the price paid for Australian wheat, resulting in a net loss in welfare to Australia of A\$673 million in the period from 1965 to 2020.

CIMMYT's release of new varieties during that 55-year period included substantial benefits for Australian producers. Many of the benefits derived from CIMMYT in that period accrued to Australian producers in the form of improved varieties. Without those spill-over benefits, the net welfare loss from improved varieties would have been A\$2,099 million,



PHOTO: SHU FUKAI

CLIMATE CHANGE: Climate change, or global warming, is creating an added layer of uncertainty for farmers everywhere. ACIAR is working with the Consultative Group on International Agricultural Research, in particular its international research centres such as IRRI (rice), CIMMYT (wheat and maize), ICRISAT (farming in the semi-arid tropics) and ICARDA (dry region agriculture) to develop adaptation technologies. These cover new crop varieties, improved water management, and research into some of the fundamentals of agricultural security such as genetic diversity. Soil science is also an important part of this broad agenda—the condition of nutrient-depleted and rainfall-depleted soils in areas that need to sustain large populations being one of the most critical elements in the fight against poverty.

PHOTO: BRAD COLLIS



AGRICULTURE'S SEED HUNTER: Australian genetic resource scientist Dr Ken Street, who is based at the arid farming research institute ICARDA, in Syria, has attracted increasing public attention for his seed-collection missions in remote and rugged terrain in the Central Asia/Caucasus region (the birthplace of agriculture). Dr Street has been looking for ancient plant species which, through their 'tough' genetic background, could help deliver more climatically robust modern crops. Dr Street and his work are the subject of an ACIAR-supported documentary, *Seed Hunter*, which first screened in Australia in 2008. ACIAR has supported a number of Dr Street's seed-collection missions.

as global production rose. Because Australian producers were able to keep pace with global improvements rather than fall behind, the welfare loss was reduced to A\$673 million, a saving in welfare benefits of A\$1,425 million.

ICARDA research benefits Australia by A\$13.7 million a year. An assessment of the value of ICARDA research to Australian agriculture found two main sources of

benefits—reductions in costs for producers of barley, durum wheat, chickpeas, faba beans and lentils, along with a net gain on research in those cropping industries. Of the A\$13.7 million per year (based on 2001 dollars and accruing over the 20 years from 2002 to 2022) producers receive A\$12.6 million a year, with consumers of produce from the crops receiving A\$1.1 million a year. ■