

TILLING NEW KNOWLEDGE

The need for agricultural R&D is as immense as ever, but over the years the challenges have changed. One constant is the role ACIAR plays in forging the multilateral partnerships that make scientific resources available to those farmers otherwise unable to access them

BY DR GIO BRAIDOTTI

For three years ACIAR has been supporting scientists and farmers working to overcome constraints to crop production in northern Iraq and Syria. Facing a drying climate and declining crop yields, Iraqi farmers in particular are struggling to respond as they work with farming infrastructure that in recent years has come close to collapse. Last year was particularly bad, with drought destroying wheat, barley, lentil and chickpea crops. And there is no end in sight, with the current season again delivering below-average rainfall.

The ACIAR project is testing whether hardier varieties and conservation farming techniques can do in the Middle East what they did for Australian grain growers when first introduced 30 years ago: to increase yields in a dry climate by eliminating the need to plough or till the soil, which causes soil moisture to evaporate.

Sixty kilometres from the Iraqi border, in the environs of Kamishley in Syria, 40 farmers involved with the ACIAR project are among the earliest adopters of 'conservation cropping'.



Dr Colin Piggin in Syria.

PHOTOS: BRAD COLLIS

Some of these farms were included in a recent tour by 15 Iraqi farmers, who were amazed to see row upon row of plants setting seed, when across the border, on cultivated fields, dry conditions were again stunting crop development.

Earlier in the tour, scientists from the International Center for Agricultural Research in the Dry Areas (ICARDA) in Aleppo, Syria, presented evidence to the Iraqi farmers that zero-tillage techniques can make it possible to crop with less water. As expected by ACIAR project leader, Dr Colin Piggin, the farmers simply did not believe it.

He comments that it's just an innate belief of farmers that good farming means a lot of ploughing and soil cultivation.

However, Dr Piggin had anticipated the scepticism, having seen it 30 years earlier among Australian farmers. So as part of the tour, he incorporated visits to other ACIAR project partners outside ICARDA's laboratories. These included research stations, on-farm demonstration sites, manufacturers of affordable zero-till farm machinery and

the Syrian farms, which proved decisive in opening the minds of the Iraqi farmers to new possibilities ... and to hope.

The project, Dr Piggin says, is typical of ACIAR's operating style—a partnership model that excels at maximising the development opportunities presented by the world's agricultural R&D resources. The goal, he says, is to close the nutrition gap, alleviate poverty and promote development by helping the developing world access the most advanced scientific expertise.

ACIAR achieves this mandate primarily by brokering research collaborations of the kind currently in action in Iraq and also by directing funds to the research organisations whose gene banks, breeding programs and agronomic expertise made the 'Green Revolution' possible. These are the centres of the Consultative Group on International Agricultural Research (CGIAR), which include ICARDA.

Since 1992, ACIAR has administered Australia's contribution to the CGIAR that today numbers 15 research centres, with 12 working in areas considered of strategic importance



Barley growers meeting in Syria with ICARDA extension officers to discuss on-farm cropping.



The main crop-trial site at ICARDA in Syria.

to Australian aid efforts and to Australia's own agricultural enterprises and research base, which cover crops, livestock, fisheries, aquaculture and forestry.

This funding has repeatedly proven crucial for Australian farmers. In a recent example, ICARDA provided genetic resources that made it possible for the CSIRO team led by Dr Rana Munns to identify two genes (Nax1 and Nax2) that can provide wheat and durum varieties with greater tolerance to saline soils. The material came through Dr Ken Street, an Australian genetic-resource scientist based at ICARDA whose collection missions for 10 years were supported by ACIAR.

"That is one of the really positive features about ACIAR—they are very collaborative in the way they run projects and that makes it possible to draw the maximum benefits to the most players from agricultural science," Dr Piggin says. "ACIAR is particularly good at building the foundation required for cooperation, both at the international level and at the national level in developed and developing countries."

In Iraq alone, the ACIAR project takes in ICARDA, the University of Western Australia, the University of Adelaide, the Department of Agriculture and Food Western Australia, and three Iraqi institutions: the Directorate of Agriculture and the State Board of Agricultural Research—both part of the Iraqi Ministry of Agriculture—and the University of Mosul.

Dr Denis Blight, who was involved in establishing ACIAR 27 years ago and is now executive director of the Crawford Fund, says ACIAR was always envisaged as a way to enhance cooperation between national research systems in developing countries, the CGIAR centres, and what was then perceived as a vast untapped resource—Australian agricultural science.

"ACIAR's partnerships were never predicated on just the CGIAR," Dr Blight says. "Rather, what was envisaged was a match-making role whenever Australian scientific expertise had something to offer developing-world needs. What emerged are the brokerage skills needed to build, manage and fund joint ventures that can address the enormous need to raise the

productivity of agricultural systems in ever more sustainable ways."

As new challenges to food production have emerged over the years, the range of organisations opting to work with ACIAR has steadily grown.

In projects across the Middle East, Central and South-East Asia, and the Asia-Pacific region, grassroots and farmers' groups such as the Vietnam Women's Union, non-government organisations such as World Vision, philanthropic foundations such as the Bill and Melinda Gates Foundation, and international agencies such as the World Bank are all seizing opportunities to pursue their aid mandates through collaborative research partnerships with ACIAR.

In the process, the research base tapped by ACIAR programs has expanded too, notably in the areas of mitigation of and adaptation to climate change, and the conservation of genetic resources. Sometimes this ongoing need to update R&D capability sees ACIAR participate in the establishment of new research agencies, as happened with the Centre for International Forestry Research (CIFOR).

A long-standing practice of independently assessing project outcomes has seen ACIAR's approach repeatedly vindicated. Benefits found to accrue to developing countries and Australia are often valued well above the amounts invested. And although other countries—notably Canada, Japan and Germany—have since adopted the model, Dr Blight says ACIAR's contribution remains unique and uniquely needed for one crucial reason.

"Australia, alone among countries with advanced agricultural R&D expertise, shares the agro-climatic conditions often found in developing countries," he says. "We are the only donor that has extensive tropical areas, semi-arid regions and poor soils, yet succeeds in producing agricultural surpluses that feed 50 million people beyond Australia's shores."

As Syrian and Iraqi farmers are discovering, that common bond can run deep. For it is in Syria and Iraq that many cereals grown in Australia were first domesticated and cultivated, and it is here that the gene pool is most genetically diverse.

So while Australian and ICARDA agronomists and plant breeders help Middle Eastern farmers crop their drying soils, Middle Eastern gene banks and genetic-resource expertise hold a key to finding the traits needed to meet future food production challenges. Which, for all partners, means first and foremost a common need for greater drought tolerance. ■