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partners
IN RESEARCH FOR DEVELOPMENT

HERALDING THE GENE REVOLUTION

Widespread drought in recent years in both the northern and southern hemispheres, combined with increasing awareness that climate change is likely to make such extreme conditions more frequent, is starting to draw the wider community's attention to farming and food security.

There is an awakening to the fact that the world's food crops are vulnerable to rapid changes in environmental parameters, and this combined with diminishing and degrading land and water resources has already placed global food supplies in a precarious position.

The need to rapidly adapt crops—including crops that support livestock production—to cope with environmental and other production constraints, plus lift yields, is placing unprecedented pressure on agricultural science.

Not since the Green Revolution has there been this level of urgency on the work of plant breeders to lift the productivity and environmental resilience of food crops, particularly those that sustain the bulk of the world's populations in developing countries.

The Green Revolution staved off famine in Asia in the 1960s, with new high-yielding rice varieties lifting Asia onto a pathway of economic and social development. Now a new revolution is emerging; crop resilience and adaptability—a gene revolution.

This new challenge is highlighting the critical importance of genetic diversity, which inherently requires a global perspective. It needs genetic resources to be pooled into a global research network that brings capacity and scientific resources to the development of a new generation of high-yielding, highly adaptive and highly robust food crops.

Facilitating this is a role in which ACIAR has long experience, creating research and extension partnerships that have been successfully improving and securing food production in developing countries around the world; particularly in our own Asia-Pacific region.

To help drive this next research priority ACIAR can draw on its long-standing partnerships with

the International Agricultural Research Centres (IARCs) that form the Consultative Group of International Agricultural Research (CGIAR). These centres are a critical source of genetic resources and associated expertise.

ACIAR allocates about 20% of its total appropriation to the IARCs, and about half of this investment is allocated to core, or unrestricted, funding. This gives IARCs the flexibility to open new research directions, and maintain long-term programs such as gene banks.

In this issue of *Partners* we look at ACIAR-supported projects that highlight the importance of preserving genetic diversity and how this is fundamental to food security.

Importantly, there is also recognition of the two-way benefit flowing from ACIAR's provision of Australian expertise in international agricultural development.

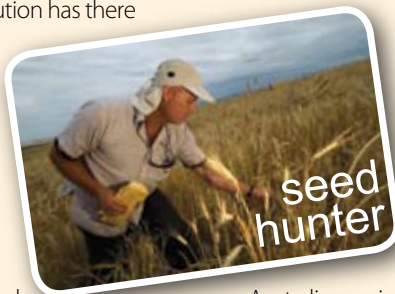
An example is ACIAR's support of research into the threatening rust pathogen Ug99. Successfully breeding cereals that can resist this latest rust biotype is as critical to the

Australian grains industry as it is to farming communities in ACIAR's partner countries.

Also by working with the IARCs, Australia is able to draw on expertise or resources not otherwise available in Australia, for example on tree crops like coffee. It can also allow Australian researchers to collaborate offshore to develop biological defences to pests and diseases before they reach Australia.

ACIAR's global presence is highlighted in an upcoming television documentary, *Seed Hunter*, to be screened in Australia and Europe later this year. The documentary by award-winning producer Sally Ingleton covers a seed-collection mission by ICARDA-based Dr Ken Street, whose work has been strongly supported by ACIAR.

The documentary shows that food security and its underlying genetic resource is stirring public interest. Hopefully it will raise community understanding of these issues and the vital role being played by Australia through the activities of ACIAR. ■



Partners in Research for Development is the flagship publication of the Australian Centre for International Agricultural Research (ACIAR). *Partners* presents articles that summarise results from ACIAR-sponsored research projects, and puts ACIAR research initiatives into perspective.

Technical enquiries will be passed on to the appropriate researchers for reply. Reprinting of articles, either whole or in part, is welcomed provided that the source is acknowledged.

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Features

Arctic vault holds the food hope of future generations

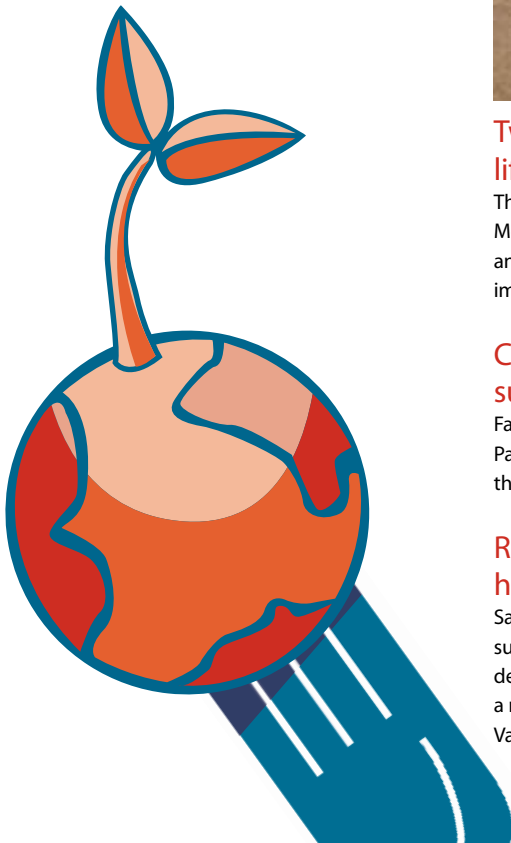
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Construction of a massive seed storage vault in the Arctic could be a sign of growing political and community awareness of the fragility of agriculture's biological base and the fundamental need to preserve crop biodiversity

The gift of food security

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By drawing on genetic diversity to improve crop varieties in developing nations that have experienced civil unrest or war, Australians and Australian aid, and ACIAR in particular, help communities along the road to social and economic recovery



Genetic identity a key to securing fish populations

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Research to understand the genetic diversity of distinct fish populations is playing an important role in rebuilding depleted populations and helping to manage stocks for the future



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Scientists around the world are working against the clock to build a genetic defence against a wheat disease that some fear could seriously destabilise global food security



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Farmer involvement in sweet potato variety trials in Papua New Guinea is giving people a wider choice that, in turn, broadens people's income prospects

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Sandalwood plantations that exploit genetically superior stocks could help to meet the growing global demand for the precious commodity, while generating a much-needed cash income for local communities in Vanuatu and Cape York Peninsula



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