



ANNUAL CONFERENCE MEDIA RELEASE

Embargo: 3 September 2008

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Climate-Ready Crops Needed to Prepare Australian and Pacific Rim Agriculture for Climate Change, Says Global Seed Expert

Scientist Behind Doomsday Vault Calls for New Global System to Safeguard Agriculture from Changing Climate at Crawford Fund Conference in Canberra

Nations will soon face an even greater food crisis unless the world puts a premium on breeding new varieties of crops resistant to climate change, warns Dr Cary Fowler, a leading expert on agriculture and Executive Director of the Global Crop Diversity Trust, a Rome-based organization leading the worldwide effort to conserve farm diversity.

Speaking at The Crawford Fund Annual Conference in Canberra, Fowler said, "Adapting agriculture to climate change will require the development of a new global system that will focus on conserving unique crop diversity and making certain that diversity is legally and practically available to all," says Fowler, "If we don't, we will experience food shortages far worse than the current crisis."

Fowler warned that food security in the Asia-Pacific region is threatened by increased risk of drought, higher salinity in coastal areas, energy and water constraints, low stockpiles, population growth, and new threats to crops from pests and diseases. Extremes in temperature and rainfall have already created serious problems for farmers -- in Australia as much as in other parts of the world. Alarming, the 12 hottest years on record have all occurred since 1990. A "perfect storm" is brewing, and new—and often radically different—climate-ready varieties will be required for the transition.

Confronted by this critical situation, hundreds of scientists, plant breeders, farmers -- supported by the Global Crop Diversity Trust -- are undertaking a rescue mission to identify and save as many distinct crop varieties as possible. Globally, the poor depend inordinately on a group of neglected crops, including roots and tubers, which are critical to nutrition, food security, and livelihoods in many developing countries. In Asia and the Pacific, for example, these crops serve as major sources of Vitamin A and from 15-43% of the dietary energy needs in the Pacific, depending on the island. Unless diversity is conserved, documented, and made available to plant breeders, these crops will no longer be able to support the communities that rely on them.

According to strategies whose development was supported by the Trust, priority crops for the Asia-Pacific region include the sweet potato, one of the world's top ten crops in terms of energy but whose various collections, including one of global significance in Papua New Guinea (PNG), are in need of proper management and sustainable financing. Other important crops include various types of taro, especially the Giant Swamp Taro, which is found exclusively in the Pacific, and while it is a classic "survival food" it is neglected in terms of research and development; and fe'ii banana, a uniquely Pacific type that has great potential in alleviating Vitamin A deficiency. Fe'ii bananas are extremely poorly represented in global collections, and material established in PNG and French Polynesia have already been lost.

“We don’t have the option of failing to get our agriculture ready for climate change and ready to feed a growing world population, and that means safeguarding collections” says Fowler. “There is no country in the world, rich or poor, large or small, which is self-sufficient in the genetic diversity of the crops which feed its people - no country can make it on its own.” Even large genebank collections typically contain only a small portion of the number of samples held globally.

Australia is a good example. Its collections hold 3% of the wheat samples found in genebanks globally. Ask anyone here whether they are confident that Australian wheat production could continue to be on a sound footing were it to be based solely on this 3%, and the response would certainly be “No,” says Fowler. Moreover, a strain of wheat stem rust disease emerging from East Africa is gravely threatening world wheat production, as scientists believe it will move to India within the next couple of years, posing a high risk of eventually reaching Australia via high altitude movements.

In his speech, Fowler focused on several priorities for the way forward.

Step one involves making an initial assessment of where the largest, most important, but most vulnerable crop collections are, regenerating them (because seed dies), and securing duplicates in another genebank. The Trust has provided support to develop global strategies for more than 20 crops, including identifying such collections. In parallel, endangered diversity found in smaller collections needs to be identified. Crop and regional networks are well placed to do that, and the Trust is providing financial and technical support to regenerate samples held in the smaller collections identified through networks.

Step two involves developing appropriate information and information systems. This means learning more about the genebank’s unique seed samples themselves – an exercise that should, where feasible, be focused on traits of high priority (e.g., screening collections for heat and drought resistance). It also means developing the software tools – for genebank management, and for globally searching multiple genebank holdings – that will facilitate good management and effective use. Again, the Trust is providing support for this.

Step three involves guaranteeing the long-term conservation and availability of these collections – because this biological foundation of agriculture will be as important far into the future as it is now. To provide permanent financial security to the world’s most important collections, the Trust is raising an endowment fund, to which Australia is one of the earliest and most generous contributors.

“With focus, pragmatism and determination, we will succeed,” Fowler said. “We will help ensure that agriculture is ready to promote development, provide food security, and help humanity adapt to climate change and a new age of resource constraints.”

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The Global Crop Diversity Trust (www.croptrust.org): The mission of the Trust is to ensure the conservation and availability of crop diversity for food security worldwide. Although crop diversity is fundamental to fighting hunger and to the very future of agriculture, funding is unreliable and diversity is being lost. The Trust is the only organization working worldwide to solve this problem.

Conference info and media materials at <http://www.crawfordfund.org/events/conference08media.htm>
Keynote speakers include Ms Katherine Sierra, Vice President for Sustainable Development, World Bank; and Prof Ross Garnaut, author of the Garnaut Climate Change Review.

The Crawford Fund wishes to thank the sponsors for this event, including AusAID – the Australian Agency for International Development; Australian Centre for International Agricultural Research; Australian Government Department of Agriculture, Fisheries and Forestry; Australian Government Department of Climate Change; CAB International; Centre for International Forestry Research; International Maize and Wheat Improvement Centre (CIMMYT); Consultative Group on International Agricultural Research; CSIRO Climate Adaptation National Research Flagship; Grains Research and Development Corporation; Industrial Research Ltd; Rural Industries Research and Development Corporation; South Australian Research and Development Institute; The World Bank.