

## *Rice research brings hope for cereal growers*

Powerful Tools to Protect Farmers' Crops from Drought

**In a surprising development, international rice researchers expect to have some good news in the coming years for Australia's drought-ravaged cereal growers.**

Ronald. P. Cantrell, the director general of the Philippines-based International Rice Research Institute, says the recently completed map of the rice genome will soon put powerful new tools into the hands of agricultural scientists working to protect farmers' crops from drought.

Completed late last year, the detailed sequencing of the rice plant's DNA by the International Rice Genome Sequencing Project (IRGSP) will help researchers pinpoint the genes that govern drought tolerance – not just in rice, but also in other key crops.

Because the genomes of all major grain crops are highly collinear, with shared genes appearing in similar positions on different genomes, locating a gene for drought tolerance in rice tells wheat researchers, for example, where to look for the equivalent gene in wheat.

Dr. Cantrell, who is in Australia this week on an official visit, says he is confident that one day this will lead to improved drought tolerance in Australian cereals, especially rice and wheat. "Rice is seen by researchers as a model crop, from which we can learn a lot that can be applied to other cereals," Dr. Cantrell says. "And the good news is that this is a time of unprecedented growth in our knowledge about rice."

In December, Japan's National Institute of Agrobiological Sciences (NIAS), the leader of the IRGSP, launched a five-year collaboration with IRRI to unlock the secrets of rice gene functionality, with particular attention to tolerance for stresses such as drought. The partnership combines the expertise of NIAS as a world leader in rice genomics research, IRRI's four decades of experience in rice biology and breeding, and the vast store of genetic resources held in trust in the International Rice Genebank at IRRI.

Genomics research also promises to accelerate a proposed revolution in rice farming in water-short environments. IRRI is developing so-called "aerobic rice" for growing in unflooded fields, as is wheat, to cut water losses from percolation, seepage and evaporation. Low-yielding aerobic upland rice varieties already exist for subsistence agriculture in the mountains.

The IRRI project aims to develop a package of input-responsive aerobic varieties and agronomic techniques so farmers in irrigated lowlands can maintain high productivity while using much less than the 3-5,000 liters of freshwater currently needed to grow one kilogram of rice. This would

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preserve world food security while freeing water resources for industrial development and nature conservation.

“Important aspects of this research are being funded by Australian taxpayers, so we are committed to sharing all the benefits with Australian farmers through our collaborative partners in Australia such as the Australian Centre for International Agricultural Research, Yanco Agricultural Institute and the CSIRO,” says Dr. Cantrell, referring to the Commonwealth Scientific and Industrial Research Organization.

“Despite the tough times many farmers are having at the moment, they should take heart in this being one of the most exciting periods in the history of biological sciences. Over the past few years, we have been learning more than ever before about the crops that we depend on for food. And it’s just a matter of time before we see some really important benefits passed on to farmers to help them deal with problems like drought.”

For more information, visit the websites of CGIAR ([www.cgiar.org](http://www.cgiar.org)) or Future Harvest ([www.futureharvest.org](http://www.futureharvest.org)). Future Harvest is a nonprofit organization that builds awareness and supports food and environmental research for a world with less poverty, a healthier human family, well-nourished children and a better environment. Future Harvest supports research, promotes partnerships and sponsors projects that bring the results of agricultural research to rural communities, farmers and families in Africa, Latin America and Asia.

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