



Research rewards

by Cathy Reade, Crawford Fund

The 'perfect storm' that caused the food price crisis back in 2008 has not disappeared. Recent natural disasters have highlighted the need for greater investment and research and development into agriculture to boost production and reduce poor farmers' vulnerability. At a recent Crawford Fund conference on food security, it was reported that an independent analysis of 120 Australian agricultural research projects had proved their total benefit was \$31.6 billion from an outlay of \$372 million. Here are some Australian-supported examples of agricultural research currently under way. These examples focus on helping poor people to cope with climate change, land degradation, loss of biodiversity, rising food prices, the energy crisis, and a world population explosion.

Rice rewards

Rice is the most important food staple for humans with more than three billion people eating it every day. It is particularly important in Asia where the supply of rice is closely linked to food security and where ensuring there is enough affordable rice for everyone is the key to addressing poverty. India is the world's second largest producer of rice yet many Indian farmers, particularly those with land least-suited to rice production, suffer crop losses because of flooding every year. Through a research project that took 20 years to complete, the International Rice Research Institute developed a rice variety that, unlike any other, can survive for up to 17 days under water and still produce rice grain. This submergence-tolerant rice is being adopted at unprecedented rates, proving its capacity to improve rice production across Asia and to improve the lives of farmers and their families. Mini-kits containing five kilogram packets of the so-called 'scuba rice' seeds are currently being distributed to farmers across India. Mostafa Kamal is a Bangladeshi farmer recruited to test the submergent rice on the six-hectare farm he shares with his brothers. The farm must feed 22 family members. While a large farm by Bangladeshi standards, it suffers heavy

losses because of flooding every four out of five years. 'In the past, many of my plots became fallow because they were flooded too often,' said Mr Kamal. 'If we can cultivate on these plots, it will help us produce rice to sell on the market.' When 95 to 98 per cent of the plants recovered after the next flood, Mr Kamal was so encouraged he planned to give away—not sell—a kilogram of flood-tolerant seeds to each of his neighbours who lost their entire crops.

Tilapia a GIFT

Aquaculture, or fish farming, is the world's fastest-growing food production sector. In South-East Asia, tilapia farming is a major contributor to this growth. For more than two decades, the WorldFish Center and partners have worked together on the Genetic Improvement of Farmed Tilapia (GIFT) project. This project has resulted in both the development of an improved tilapia strain and new technology that can be applied to the production of tilapia and other species. Scientists at the centre have proved that the new strain outperforms farmers' strains in Asia, with growth rates improving between 30 and 80 per cent with no changes to the survival rate. These strains are being grown across



Asia, which produces about 80 per cent of all farmed tilapia. The technology is now being taken to Africa with remarkable success in Egypt, Ghana and Malawi.

More maize'ing results to come

Maize is an important source of food, especially for poor people in southern and eastern Africa. Sadly, not enough is grown to go around. Legumes are a rich source of protein and vitamins. They also act as a natural soil fertiliser and can be sold for cash. As a result, legumes and maize are essential to improving food security and incomes. Farmers in five African countries are getting the opportunity to improve their maize and legume crops to levels closer to what's experienced in other parts of the world. This is thanks to Australian-supported program, SIMLESA, led by the International Maize and Wheat Improvement Center. Scientists from Australia, Ethiopia, Kenya, Malawi, Mozambique and Tanzania are working with farmers to find ways of boosting crop yields in the face of pests, droughts and diseases. The program is also introducing new farming techniques such as 'minimum' or 'zero' tillage—where seeds are planted without ploughing to help retain moisture, reduce soil erosion and cut the drudgery of work involved.

It's hoped that this four-year program, an initiative of the Australian Centre for International Agricultural Research (ACIAR), will increase small-scale farmers' food production by 30 per cent within the next decade. The program is targeting 500,000 farms in the five countries, which is expected to increase the food security of three million people in eastern and southern Africa. During a SIMLESA farmers' field day with about 300 farmers in Embu, Kenya, Erasmus Njiiru Clement talked about the farm he and his wife have. Their farm is being used as a pilot for the SIMLESA program. They're trying out manure, fertiliser, new tillage practices and intercropping. 'The methods we are using are better from the methods we were using, and we are expecting a better yield than the former days,' Erasmus said.

ABOVE LEFT: A field test of submergent rice in Bangladesh. Photo: IIRRI

LEFT: Ayele Bedaso with haricot beans monitored in a SIMLESA intercropping trial in Boset district, Ethiopia. Photo: John Dixon/ACIAR

ABOVE: Harvested tilapia in Bangladesh. Photo: WorldFish Center