TO MAKE A DIFFERENCE: HOW GOOD IS THAT?

A life as a farmer on the back blocks of north-west New South Wales beckoned to Dr Peter Carberry before a flair for agricultural science opened a career that took him to the back blocks of Africa, India, Australia and places in between

BY **MANDY GYLES**
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On finishing his agricultural science degree at the University of Sydney back in 1981, being a farmer and getting involved in the local rugby team were foremost in Peter Carberry's mind.

But wind the clock forward 34 years over a remarkable research career and Dr Carberry today is the deputy director-general for research at the International Crops Research Institute for the Semi-Arid Tropics (ICRISAT) in Hyderabad, India. This follows a 28-year research career with CSIRO.

Along with Dr Brian Keating (page 12), Dr Carberry is a co-creator of the Agricultural Production Systems sIMulator (APSIM). It was APSIM and the need for a crop model for pearl millet that first brought Dr Carberry to ICRISAT 33 years before his current appointment, having been lured to India by the opportunity for postgraduate study and to see the world.

"We always say that APSIM started in Kenya with an ACIAR-funded project," he says. "It was there we realised you can't just deal with a single crop model. We also had to consider how the crops interface with the farming systems as a whole—the seasonal pattern of rainfall and dry, the rotations and soil. We had to rethink the way modelling worked."

That is the reason APSIM is different to most other models—it is a systems model, not a crop model. It incorporates the best knowledge from soil science, crop physiology, crop agronomy, genetics and environmental mechanics to create a virtual landscape.

"It allows researchers to explore their theories about how to change farming practices for the better in virtually no time," he says. "Having worked on APSIM now for 30 years plus, I would be confident that if you ran it for a new environment around the main farming systems, it will give you 80% of the story. You don't have to do five, 10, 15 years of experiments."

About 15 years ago Dr Carberry shifted his research emphasis from building APSIM to exploring if it could support farmers, advisers and agribusiness professionals in Australia.

"We built a tool called Yield Prophet that's attuned to farmers who want to check on their own intuition or analyse their situation," he says. "It's a commercial service developed by farmers and owned by farmers through the Birchip Cropping Group (now called BCG) and delivered for farmers and agribusiness on a subscription basis. It's mainly used to analyse production risk through factoring in optimum sowing time for different cultivars, and other variables such as nitrogen requirements during the season and rainfall."

Dr Peter Carberry speaking with a pearl millet farmer in Gujarat, India.

PHOTO: JOANNA KANE-POTAKA

Dr Peter Carberry was previously a senior researcher and manager at CSIRO for 28 years. In that time he worked on ACIAR projects in Kenya, Indonesia, South Africa and India. For the past five years he has held a senior role in the Australian Food Security Initiative in western and eastern Africa.

The latest version of Yield Prophet links climate and rain forecasting models to reduce production risks in low-rainfall areas in southern Australia.

Given its origins within an ACIAR project, APSIM is also associated with many international farming developments. For example, it has changed the way smallholders produce beef cattle in Indonesia.

"Australian researchers did a lot of work on pastures in Indonesia, but it wasn't being adopted by the farmers," says Dr Harm van Rees, who recently evaluated the impact of APSIM internationally.

Through an ACIAR project, CSIRO adapted APSIM to consider a household model—looking at how the family structure operated in terms of time and resources. It evaluated the impact of growing a small amount of forage near the home and keeping the cattle in nearby pens. It resulted in farming innovations that have since been widely adopted.

"The high adoption rates achieved by the CSIRO team—and Dr Carberry was central—is that its focus was on the farmer; it is an approach that is in these Australian scientists' DNA," Dr van Rees says.

That creates a near-perfect synergy with ICRISAT and Dr Carberry says he is thrilled to be back, accompanied by his wife, Anne.

He is planning to build up the farming systems focus within ICRISAT research, creating more robust impacts for farmers in the semi-arid tropics of south Asia, Africa and Australia.

"I argue that you will always see Australians at ICRISAT," he says. "If I go out to Indian farms, I can walk onto the same soil that I would have been farming if I'd become a farmer years ago.

"The vertisol soils here are the same as my brother Andrew's farm at Narrabri, New South Wales. It has the same climate variability—a drought one year and flood the next. So I think Australians are attuned to thinking about these systems."

He encourages young people to step out of their comfort zone and use their expertise to take on these big challenges in the world. "I've been to places—the back blocks of Burkina Faso or India or Zimbabwe—not many people get to see and I get to make an impact. How good is that? Agricultural science is a fantastic career." ■

ICRISAT

The International Crops Research Institute for the Semi-Arid Tropics (ICRISAT) conducts agricultural research to empower people to overcome poverty, malnutrition and a degraded environment through better agriculture. It has a strong focus on sustainable on-farm intensification and building agribusiness opportunities for smallholder farmers.