



Summit grapples with feeding growing world

By NEIL LYON

CAN the world's plant breeders and crop farmers continue to increase food production at a pace to match the world's population growth, predicted to increase from the current 7.2 billion people to 9.6 billion by 2050?

That was one of the weighty questions the world's top wheat breeders grappled with at the Borlaug international wheat summit in Mexico in March.

Imperial College London professor

of international development, Sir Gordon Conway, told the conference that while food production currently matched population growth, the emerging middle class and changing dietary demands of developing countries were presenting new challenges to the food-production sector.

"If you are just talking about feeding more people as they are being fed now, we can do it. But the big challenge is that in many of the emerging countries like China, India, Brazil, Mexico and Korea, their diets are changing,"

he said. "They are consuming more livestock products and that needs grain, so we will need more grain to feed them. China, for example, is producing a large amount of livestock now, and is importing two-thirds of the world's soybean market."

Prof Conway said any advances in food production would have to be achieved in a world where good quality land and water supplies were at their limit.

"So we are going to have to produce more with less. That is the mantra for

the future. Scientists know how to do that. But we have to intensify sustainably, which means we have to use less damaging inputs like pesticides and fertiliser, reduce the amount of greenhouse gasses from agriculture, improve soil water-holding capacity and make it more resilient to climate change.

"It is not just intensification we need, which will be tough enough to achieve, but we have to do it in a way that is sustainable. Sustainable intensification is the biggest challenge the world has ever seen."



Australian wheat breeder and former CIMMYT director of wheat research, Tony Fischer.



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QC1649029

Feeding the world in the future is an issue CSIRO honorary research fellow and former director of wheat research at the CIMMYT centre in Mexico, Tony Fischer, has canvassed in a new book he co-authored with Derek Byerlee and Greg Edmeades, titled *Crop Yields and Global Food Security: Will yield increases continue to feed the world?*

Dr Fischer told the Mexico conference that while plant breeders were still increasing on-farm yields in most crops by about 1 per cent per annum, it was going to become increasingly difficult to keep up that rate of production increase.

He said it was no longer possible to achieve the substantial increases of the past that have seen wheat yields in Mexico's Yaqui Valley increase seven-fold in the 65 years since the late 1940s when yields were below 1 tonne/hectare. When Dr Fischer arrived in Mexico to work at CIMMYT in 1970, production under irrigation had reached about 4t/ha.

"I remember how excited we were in 1975 when it reached 5t/ha. And just last year the valley hit just over 7t/ha," he said. "So there is ongoing progress, but the relative rate of progress is slowing down."

"It was very spectacular in the first years. Now it is down to 1pc. Yet the figures suggest we need to be above 1pc if we are going to feed the world."

Dr Fischer said of the three staples – wheat, maize and rice – wheat would be the most difficult to achieve significant advances in production.

With fewer opportunities for agronomic and on-farm advances to lift wheat production, the focus would be on breeders to achieve the gains through variety performance improvements, but it would be a very difficult task.

"The demand for wheat is stronger than the demand for rice, and the yield gaps for wheat between what farmers are getting and what we get on the experimental stations are smaller. So in the case of wheat, there is less scope for gap-closing, which means there is more need to make the progress through breeding."

"Maize yields are growing at 1.5pc per annum, dominated by a very strong private sector, hybrids and genetic engineering. There are big yield gaps between what farmers are getting, particularly in sub-Saharan Africa and India. So I think maize will stay ahead of demand better than rice, and both of them better than wheat."

Dr Fischer said there was an urgent need to boost investment in research, development and extension to meet the increasing demands on global food production.

"And in those parts of the world where there is a huge yield gap between what we get on an experimental station and what farmers get, there is a need for a huge investment in all the things we take for granted in developed countries like Australia – that is roads, markets, rural education, institutions, land tenure. All those things act as a drag on farmers modernising."

Closer to home, Dr Fischer called for increased investment in agricultural research and development in Australia, where he attributed a declining rate of crop advancement to cutbacks in research funding.

"There has been a slowdown in productivity growth in the Australian wheat industry in the past decade, even if you account for the severe droughts in the first decade of this millennium."

"There has been a marked reduction in the percentage of our agricultural gross domestic product we invest in research."



Imperial College London professor of international development, Sir Gordon Conway.