

Professor Pangirayi Tongoona

“Towards food security with demand-led plant breeding”

Professor Pangirayi Tongoona is the Deputy Director of the West Africa Centre for Crop Improvement (WACCI), having spent many years as Professor of Plant Breeding at the African Centre for Crop Improvement at the University of KwaZulu-Natal in South Africa and also the University of Zimbabwe. He is a cereal breeder and an academic, with teaching and administrative roles that include responsibility for the innovative training manual on demand-led plant breeding.



He explained *“demand-led plant breeding is a process of sustained and regular interactions with all the value chain stakeholders about the varieties being developed. It therefore goes much farther than the structured farmers’ discussions characteristic of the Participatory Rural Appraisal (PRA) taught within WACCI’s PHD curriculum.*

Before demand-led plant breeding, the plant breeders’ priority had largely been to create and develop new plant varieties based on what the breeders thought farmers’ needs and preferences were. But recognition and the incorporation of market influences and consumer choices is now a core part of WACCI’s education syllabus, and this is starting to change the breeders’ priority.

Markets are developing fast and African breeders, whose numbers will be increased with successive cohorts of new graduates, will need to rise to the challenge not only of serving and satisfying farmers but also the distributors, retailers and others in the value chain that leads directly from the market.

Professor Tongoona points out that in the original Green Revolution in India in the 1960s, there was no real consultation even with farmers about either the crop protection materials or the seed varieties to be chosen and used. Central processing systems provided a ready market for produce from the farmers and vast uniform environments facilitated the planting of a few elite varieties. The difference in Africa, as he points out, is that most farmers grow crops for subsistence in the first instance and for sale to the markets if there is excess. The environments now vary widely, requiring many niche varieties to suit each of them.

In the past, students in agricultural subjects went overseas for postgraduate training. Some came back to their countries but others did not return. It amounted to a brain drain from Africa. But these days, students are applying in Africa the lessons they have learned in African training institutions. The best breeders being trained at WACCI are now home-grown, home trained, and starting to encourage the new demand-led practices and principles.

African agriculture has the potential to improve substantially, and there is plenty of room for growth. Says Tongoona, *“We could quadruple the volume of food coming out of Africa, and actually contribute to providing more and better choices in the world’s markets”.* In the region as a whole, he estimates that there are just about 500 active plant breeders but there would need to be at least 3000 and even more to achieve a new African Green Revolution. The total number of plant breeders in the USA, with its highly developed agricultural system, is about 2,200 but on less than a third of the agricultural land of Africa. There is a huge and continuing need for additional trained plant breeders in Africa every year.

To this end, WACCI is compiling a database of plant breeders in Africa and a network of young breeders from the early cohorts of graduate PhDs. A similar process is under way in East and South Africa with the African Centre for Crop Improvement (ACCI). In the future, such training programmes as those of WACCI and ACCI should be part of an agreed pan-African agricultural policy, with national governments committing to funding the educational programmes and principles of modern plant breeding throughout the region, in co-operation with continental bodies such as NEPAD (New Partnership for Africa's Development), that are the implementing agent for the African Union.

Professor Tongoona is proud of the achievements so far, *“WACCI compares with plant breeding institutions anywhere in the world. There's a wonderful curriculum which gives the students all the fundamentals of plant breeding, population genetics, quantitative genetics, biotechnology, and other skills as well – leadership, management, accounting, project management. We are keeping abreast of new developments, as is the case with best practices in demand-led breeding and integrating them into our education programme. Together with our partners in other parts of Africa, we are on course to provide Africa with the plant breeders it needs”.*

Thus the world class students produced each year represent nothing less than the harbingers of the African Green Revolution. Virtually all the graduates have gone back to help their national programmes as intended. They are starting to create a stable legacy of the knowledge and experience needed for the assurance of food and nutritional security in Africa.