



DISCOVER

ENGAGE

IMPACT



## GROWING IDEAS FOR A BETTER FUTURE

**UQ is leading a vital agricultural partnership between research institutions and industry to increase efficiency in crop plant breeding, ultimately helping to overcome global food shortages.**

### Securing reliable and sustainable sources of food for an ever-growing global population is one of the most important concerns facing humanity.

Currently, around 795 million people around the world – almost 10 per cent of the world’s population – are undernourished. Many of these people are farmers, who struggle against poor soil, plant diseases, pests and drought to generate not just food for their own families, but also enough to secure their livelihood.

With the world’s population expected to exceed nine billion by 2050, food production will need to increase by 70 per cent to sustain humanity’s ever-growing impact on our planet.

However, it’s not all bad news. According to the UN’s Food and Agriculture Organization, up to 75 per cent of this demand could be met by increasing existing crop yields, rather than expanding the area of production.

The Bill & Melinda Gates Foundation, working with partner organisations, provides billions of dollars each year to alleviate world hunger and poverty. The foundation recognises that the best way to reduce hunger and poverty over the long term is to help farming families sustainably increase their production. One of the best ways to help farmers achieve this is through breeding better varieties.

To ensure their investment in food production is directed where it is most needed, the foundation developed the Breeding Program Analysis Tool (BPAT) to assess breeding programs in developing countries. BPAT is a structured review of technical, capacity and management components of plant breeding programs, which aims to help create improvements that increase efficiency and achieve higher rates of genetic gains in crops.

Thanks to its international reputation for excellence in plant breeding, the Bill & Melinda Gates Foundation awarded The University of Queensland a US\$2.7 million grant to implement BPAT, aiming to significantly improve plant

breeding in developing countries and maximise increases in crop yields by implementing this innovative new assessment tool.

Dr Chris Lambrides from the School of Agriculture and Food Sciences and Professor David Jordan from the Queensland Alliance for Agriculture and Food Innovation are leading the project.

“This is a very exciting program because it will contribute to making a real difference to millions of resource-poor farmers worldwide,” says Dr Lambrides.

“We can help breeding programs create new cultivars that have higher yield, which will bring greater profitability to farmers and help alleviate poverty in the developing world.”

The tool aims to help breeding programs overcome the management challenges they can face, such as breeding institutions being managed as if they are university departments, with scientists rewarded for publication, rather than product development; researchers having limited access to farmers and consumers and understanding of market requirements, meaning research may not be targeted in the right areas; and breeders having limited access to technology and expert advice, affecting their ability to optimise their research.

The UQ team is collaborating with CGIAR, a global agricultural research partnership, to identify suitable breeding programs to participate in the assessment.

The assessment process usually takes 10–12 weeks. It starts by introducing the assessment to the institution through a group call.

Questionnaires are then sent out to breeders and other staff at the institution to collect information about the breeding programs.

Next, the team visits the institution for three to five days, meeting staff and touring the facilities.

Finally, the team combines the information from the visit and the questionnaires to create a scorecard and report that describes

the breeding program’s strengths and then discusses areas for improvement.

This assessment can then be used by breeding programs as a basis for developing an improvement plan, and may also be used in the future by selected donors for evaluation and developing investments in crop improvement.

Since starting BPAT, the team has visited breeding projects in Ethiopia and India.

Eventually the project will extend across 11 breeding programs in Sub-Saharan Africa and South Asia, covering plants including sorghum, rice, maize, wheat, chickpeas and bananas.

The team has also developed the BPAT website, which acts as an information hub, providing tools that allow organisations to conduct self-assessments.

**“We are investigating the possibility that in the future the tool will be made available to other donors and interested parties at a reasonable cost,” says Dr Lambrides.**

[uq.edu.au/research/impact](http://uq.edu.au/research/impact)

### The journey so far:

**November 2015:** The Bill & Melinda Gates Foundation awards UQ a US\$2.7 million grant to implement the Breeding Program Analysis Tool

**June 2016:** UQ team visits plant breeding programs in Ethiopia

**November 2016:** UQ team visits plant breeding programs in India

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