

Genetic advance to ensure future of high-protein crop

Millions of people in developing countries may benefit from a breakthrough in chickpea farming thanks to an international research team involving researchers from the University of Western Australia, CSIRO and other Australian research groups.



Credit: P. Casier (CGIAR)

The goal of the Indian-based International Crops Research Institute for Semi-Arid Tropics (ICRISAT) project was to decode the genomes of 90 chickpea genotypes. Apart from Australia and India, the international effort also involved scientists from the USA, China, Canada and Europe.

The study – recently published in *Nature Biotechnology* – is significant because chickpea seeds are a major protein and nitrogen source for people living in the semi-arid tropics such as parts of India and the African countries, Ethiopia, Tanzania and Kenya.

Chick pea crops provide high-quality protein and cash income to resource-poor farmers, and fix nitrogen in the soil, which improves fertility.

Chickpea is the second-most widely grown legume after soybean and was the major grain legume crop grown in Australia last year.

The research team discovered millions of genetic markers that may be used in the development of chickpea that is higher yielding and more resistant to drought and disease. This will help chickpea farmers to be more resilient to climate change.

Like many other common crops, chickpea has a narrow genetic base because of domestication. In much of the world, chickpea is grown in semi-arid places and on poor soil which – combined with its susceptibility to drought and disease

– have restricted yields to below its theoretical potential.

In the study, researchers re-sequenced and analysed the genomes of chickpea from 10 countries. The study covered small-seeded 'desi', larger-seeded 'kabuli' and wild varieties.

The Australian contribution, led by Winthrop Professor Karam Singh, of the University of WA and CSIRO Plant Industry, was funded by the Grains Research and Development Corporation (GRDC) with further scientific contributions from the CSIRO, Curtin University and the University of Queensland.

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