Centre for Tropical Crops and Biocommodities

Delivering nutritionally-enhanced, resilient pulses

A Queensland University of Technology led research team is using innovative biotechnology solutions, accelerated breeding and crop modelling to deliver improved cultivars, enhanced tools and technologies that maximise benefits to the Queensland tropical pulse industry. As the global population increases so does the demand for plant-based proteins.

Tropical pulses including chickpea and mungbean are nutritionally-rich, high in protein and fibres but low in fat. This QUT/Department of Agriculture and Fisheries-Industry partnership will strengthen Queensland’s position as a global leader of tropical pulses.

Pulses are nutritionally rich and widely consumed for its dietary proteins, carbohydrates and fibers along with essential amino acids. Queensland with their sub-tropical/tropical environment is a major producer and exporter of premium quality tropical pulses contributing significantly to Queensland’s agricultural industry.

Key areas

- Use of chemical pre-treatment as a novel strategy to enhance roots in pulses for improved stress tolerance
- Use a novel transgenic approach to enhance the stress tolerance and pathogen resistance
- Use a transgenic approach to biofortify chickpea varieties for enhanced iron content
- Developing a mungbean Nested Association Mapping (NAM) population to identify novel genes and traits associated with stress tolerance
- Use a modelling-based strategy to investigate the effects and optimise genotype versus environment versus management (G x E x M) for chickpea and mungbean
More information about this project

Increasing climate variability, including excessive heat and water deficit as well as the increasing incidence of pests/diseases, are major risk factors that limit industry expansion and reliability. Developing resilient varieties with increased stress tolerance can secure industry during adverse climatic conditions. Pulses being a widely consumed food, particularly among vegetarian populations, could be an effective medium to alleviate micronutrient deficiencies, thereby helping to fight health disorders such as anemia. Anemia is reported to afflict more than two billion individuals in both developing as well as developed countries including Australia. The current project aims to deal with these issues though the following objectives.

Outcomes for industry

- Increase security and competitiveness for QLD farmers to produce pulses in adverse climates and marginal lands
- Reduce management cost associated with spraying and sustain economy in dry years
- Iron (Fe) and Zinc (Zn) biofortified chickpea would provide premium price
- NAM population provides precious source of new desirable traits for addressing other challenges associated with pulse production
- Crop modelling in pulses would allow prediction of suitable genotype based growth and management parameters allowing increased pulses production