The University Of Queensland
AUSTRALIA

QAAFI
Queensland Alliance for Agriculture and Food Innovation

The Queensland Alliance for Agriculture and Food Innovation

CENTRE FOR HORTICULTURAL SCIENCE

Queensland Government

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QAAFI is an agricultural and food sciences research institute of The University of Queensland – one of the world's leading research providers in tropical and subtropical agriculture and food production.

At QAAFI, our mission is to harness high tech science for sustainable agriculture and food production. To achieve this, we use game-changing technologies like artificial intelligence (AI), nanotechnology, genomics, gene editing and big data to produce safer, more nutritious food, using fewer resources.

Not only is UQ number one for agricultural science in Australia and one of the most highly ranked institutions in the world in this field, it is located in tropical and subtropical environments and, therefore, well placed as a hub for digital agriculture and delivering step-change innovations for the growth and production of sustainable and nutritious food.

Through our alliance with the Queensland Government, QAAFI researchers utilise world-class research field station facilities throughout tropical and subtropical environments in Queensland.

QAAFI delivers high–impact science to significantly improve the productivity, competitiveness and sustainability of tropical and subtropical food, fibre and agribusiness industries.

High impact science for sustainable agriculture and food

QAAFI is comprised of four inter-related research centres, with a focus on the challenges facing tropical and sub-tropical food and agribusiness sectors in the tropical and subtropical systems.

- Centre for Animal Science
- Centre for Crop Science
- Centre for Horticultural Science
- Centre for Nutrition and Food Sciences

Centre for Animal Science

The Centre for Animal Science delivers world-class research to support and transform Australia's livestock industries. We aim to enhance productivity, profitability, and sustainability across the livestock sector, with particular expertise in northern Australia's beef industry, the feedlot sector and strong programs in poultry and pork.

We combine expertise in genetics and genomics, reproductive performance, animal health and welfare, biosecurity and vaccine development, and nutrition and growth, distinguished by an integrated systems approach that links animal biology, environment, and management to deliver solutions for tropical and subtropical livestock production.

Centre for Crop Science

The Centre for Crop Science conducts world-leading research targeting enhanced profitability and sustainability of cereal and legume cropping systems in tropical and sub-tropical environments.

We pursue excellence in crop science at molecular, whole plant, and production system levels. Our integrated research capabilities include crop genetics, physiology, and modelling, along with soil science and weed biology. We work closely with industry and government, and seek synergies to meet challenges in crop science at a national and international level.

Centre for Horticultural Science

The Centre for Horticultural Science delivers improvements to productivity, profitability and sustainability of horticulture industries. Our researchers drive innovation and industry adoption to increase the competitiveness of Australia's horticultural industries.

Our expertise includes; horticulture crop breeding, agronomy, plant protection, biosecurity and diagnostics, plant propagation, orchard design and productivity improvements in existing orchards.

Centre for Nutrition and Food Sciences

The Centre for Nutrition and Food Sciences supports enhanced health outcomes and economic benefits for Australia, by conducting integrated fundamental and applied research to improve the taste, quality, appearance, nutritional value and safety of food.

We aim to understand the fundamental characteristics of food that influence processing, food quality, consumer perception and nutritional value, and translate insights into added-value ingredients, new products and new opportunities for growers and food manufacturers.

Our Rankings

UQ is ranked #1 in Australia and #6 globally for agriculture

According to the NTU Performance Ranking of Scientific Papers for World Universities 2025.

UQ is ranked #1 in Australia and #15 globally for environmental sciences

According to the QS World University Rankings by Subject 2025.

UQ is ranked #1 in Australia and #15 globally for agriculture and forestry

According to the QS World University Rankings by Subject 2025.

UQ is ranked #1 in Australia and #17 globally for food science and technology

According to the 2024 Shanghai Ranking's Global Ranking of Academic Subjects.

Our research capabilities in horticultural science

Horticulture crop breeding and agronomy

Our focus is improving the productivity and quality of horticultural crops through application of genetics and genomics in selection and breeding, integrated with orchard agronomy.

Our research includes:

- Conservation and genetic improvement of horticultural crops
- Sub-tropical and tropical fruit tree crop breeding and improvement
- Rootstock evaluation and selection to improve productivity
- Improving orchard production systems

Plant protection

We undertake research in detection and identification of diseases in tropical horticulture, and develop integrated disease management practices to reduce crop losses, improve productivity and ensure product quality.

Our research includes:

- Detection and identification of emerging and exotic pests and pathogens
- Diagnostic capability for tropical plant diseases
- Disease management in avocado, banana, citrus, macadamia.
- Phenotyping germplasm for disease resistance
- Fruit quality

Horticultural Systems

We deliver innovative cross–disciplinary platform technologies to impact the productivity, environmental sustainability and economic growth of the horticulture sector.

Our research includes:

- Novel plant propagation technologies
- Germplasm conservation
- Genomics, gene editing and modelling for crop improvement
- Clonal propagation of avocado rootstocks

Highlights of QAAFI's research into horticultural science

High-tech spray prevents and cures rusty plant threat

A process similar to that used to store human embryos is being used by scientists at The University of Queensland to save native Australian plants under threat from the invasive fungus, myrtle rust.

Teams from UQ and Botanic Gardens of Sydney are cryogenically preserving tissue from some of the most impacted plants of the Myrtaceae family, including native guava and many rainforest shrubs and trees. The technique has also been used successfully to create a cryopreservation protocol for avocado. The team is making an important contribution to protecting Australia's unique biodiversity and environment.

Passion project revitalising flagging fruit industry

A new breeding strategy to reboot Australia's passionfruit industry is being led by researchers at The University of Queensland.

The five-year project is funded by Hort Innovation and headed by Dr Mobashwer Alam, who is creating new high-quality varieties of the fruit. Dr Alam is working with industry groups and growers to trial the new candidates. Existing passionfruit varieties are increasingly susceptible to pests and disease. The aim is to create new opportunities and boost profits for growers, with resilient varieties well suited to Australian conditions.

Contacts

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The Queensland Alliance for Agriculture and Food Innovation (QAAFI) is a research institute at The University of Queensland established with and supported by the Department of Primary Industries.

Published October 2025

CRICOS Provider 00025B