Queensland Alliance for Agriculture and Food Innovation

THE UNIVERSITY OF QUEENSLAND
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QAAFI
Queensland Alliance for
Agriculture and Food Innovation

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 less 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

Leading tropical livestock research and development

The Centre for Animal Science delivers world-class research to Australia's animal industries. We aim to increase on-farm productivity and sustainability in the northern Australian beef industry and across the livestock industries, including pigs and poultry.

We have major programs and capability in genetics and genomics; breeding and reproductive capability of northern Australian cattle breeds; welfare and ethics; pest and disease control through improved detection; monitoring and vaccine technologies; nutrition; metabolism and growth.

Centre for Crop Science

Integrated research for cereal and legume cropping systems

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

Driving innovation and industry adoption

The Centre for Horticultural Science delivers improvements to productivity, profitability and sustainability of horticulture industries.

Our world-class researchers drive innovation and industry adoption to increase the competitiveness of Australia's horticultural industries globally. Our expertise includes; Horticulture crop breeding and agronomy, Plant protection and Emerging technologies.

Centre for Nutrition and Food Sciences

Consumer 'fork to farm' research focus

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.

Our Rankings

UQ is ranked #4 worldwide and #1 in Australia for agriculture
According to the NTU Performance Ranking of Scientific Papers for World Universities 2023

UQ is ranked #20 worldwide and #1 in Australia for environmental sciences
According to the QS World University Rankings by Subject 2023

UQ is ranked #16 worldwide and #1 in Australia for Agriculture and Forestry
According to the QS World University Rankings by Subject 2023

UQ is ranked #23 worldwide and #1 in Australia for food science and technology
According to the Shanghai Ranking's Global Ranking of Academic Subjects 2023

QAAFI's research impact

QAAFI delivers high-impact science to significantly improve the productivity, competitiveness and sustainability of tropical and subtropical food, fibre and agribusiness industries. QAAFI comprises interrelated research centres which conduct research across the supply chain in crops, horticulture, livestock and food, with a focus on delivering high-impact science to address the challenges facing food and agribusiness sectors in the tropical and subtropical systems, both in Queensland and globally.

Speed breeding for crops

To minimise the impacts of drought and climate change on crops, QAAFI researchers are speeding up the life cycle of crops to develop more resilient crop varieties. This world-first speed breeding technique uses light and temperature controlled greenhouses to accelerate plant growth and deliver more tolerant crops varieties. This technology is being shared with Asian and African nations.

qaafi.uq.edu.au/speed-breeding

Avocado tissue culture propagation

A world-first innovative plant growing technique that is set to double Queensland's avocado production and smash the global shortage of avocado trees. To boost production of horticulture crops such as avocado, QAAFI researchers are combining microscopic tissue culture cuttings with new plant propagation techniques to produce hundreds of plants from a single cutting ready for planting in 12 months.
We are also researching more efficient ways to propagate tree species such as macadamia, mango, lychee and other fruit trees.

qaafi.uq.edu.au/tissue-culture

Digital Agriculture

Digital agriculture makes use of integrated and connected computerised tools and information, to improve decision-making and productivity across all stages of food production – from genetics to farm management, transport and to the consumer. Agriculture is yet to experience the full effect of digital technology but leads the way in some of the frontier digital sciences, such as linking remote sensing and predictive systems with genetics and genomics.

qaafi.uq.edu.au/digital-ag

Genomics and genetics

QAAFI is home to several of the world's most highly recognised scientists working in genetics, genomics and genomic prediction across plant and animal agriculture. In crops, our integrated pre-breeding research programs deliver improved lines to industry based on advanced genetics, phenotyping, bioinformatics, trait physiology and modelling. In animals, we have major programs and capability in genetics and genomics; and the breeding and reproductive capability of northern Australian cattle breeds.

qaafi.uq.edu.au/genomics-genetics
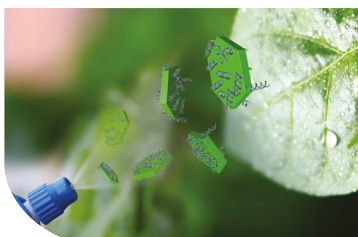
BioClay – sustainable crop protection spray

Crop viruses and pests reduce global food production by a massive 20 to 40 per cent. UQ scientists have developed BioClay - an agricultural nanotechnology innovation, to help reduce food production losses from pests and pathogens, without the toxic environmental impacts of current chemical sprays. The breakthrough technology has the potential to bolster global food security. BioClay uses a plant defence mechanism known as RNA (ribonucleic acid) interference, or gene silencing, which has been used to develop genetically modified, transgenic, disease-resistant crops.

qaafi.uq.edu.au/bioclay

Value-adding for premium Australian food brands and markets

Australian native plants are packed with unique and complex phytonutrients that allow the plant to survive in some of the world's harshest environments. The ARC Training Centre for Uniquely Australian Foods are working with indigenous industry and communities to research the nutritional characteristics of these foods – and investigate the provenance of foods grown in Australia to transform the native Food and Agribusiness Sector.

uniquelyaustralianfoods.org

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Queensland Alliance for Agriculture and Food Innovation is a research institute of The University of Queensland supported by the Queensland Department of Agriculture and Fisheries.