

Professor Sam Periyannan

Director, The ACDC

Professor (Crop Molecular Genetics)
University of Southern Queensland

RESEARCH OVERVIEW

Tell us a bit about yourself?

I grew up on a small farm in southern India, where we rotated sugarcane and cassava. With sugarcane red rot and cassava mosaic virus constantly threatening our crops, it was almost impossible not to become fascinated by plant diseases - so choosing a path in crop pathology felt completely natural.

What research have you previously been involved with?

I've had the opportunity to work extensively on wheat—one of the major crops in both Australia and India—focusing on rust diseases during my PhD at the University of Sydney and CSIRO. My research involved identifying resistance in ancestral wheat species and historic cultivars. In my early-career work at CSIRO, I then combined advances in DNA sequencing with mutagenesis to co-develop an innovative strategy for rapidly pinpointing resistance genes in large, complex plant genomes.

Current research?

The ACDC is a comprehensive national disease program which understands the impact of disease, while enhancing foundational pathology resources and capability to deliver tactical management and innovative technical solutions for cotton growers. The ACDC is a national initiative by the Cotton Research and Development Corporation (CRDC) in partnership with the University of Southern Queensland (UniSQ) and the Queensland Department of Primary Industries (Qld DPI) to understand disease pressure in cotton in Australia.



What excites you about working in the Australian cotton industry?

I'm genuinely excited about working in the Australian cotton industry, which is recognised as one of the most advanced and innovative farming systems in the world. Its rural, warm-climate focus also reminds me of home, which makes the work feel especially meaningful. What I enjoy most is the welcoming nature of the growers, industry partners and fellow researchers—everyone is incredibly friendly, supportive and easy to work with.

What do you like to do when you're not researching?

When I'm not researching, I love getting outdoors - living in Toowoomba, with its beautiful landscapes and mountain views, makes it easy to head out hiking with friends. I also enjoy exploring local cafés, trying new recipes at home, and spending quiet time reading or catching up with family and friends.

OVERVIEW

Director, the ACDC Domain B Leader: Understanding Pathogen Behaviour

Role in the ACDC:

My current role has several areas of responsibility:

- Professor (Crop Molecular Genetics) at the University of Southern Queensland
- Director of the Australian Cotton Disease Collaboration (the ACDC)
- Overall lead of Domain B: Understanding Pathogen Behaviour
- Primary or Co-supervisor of all the ACDC PhD students



What is your aim as the ACDC Director?

As the ACDC Director, my aim is to lead a coordinated research effort that deepens our understanding of pathogen behaviour and farming systems, delivers practical predictive and management tools, and reduces cotton disease losses to below 5% of production costs. I am committed to building long-term capability through expanded national surveillance and by training the next generation of specialists in cotton pathology and farming systems, ensuring the industry is equipped for future challenges.

Why is it important?

Disease is an increasing constraint on profitable cotton production, particularly as the industry expands into new regions and adopts more intensive farming practices that favour disease development. Strong scientific leadership and close industry engagement are essential to stay ahead of emerging threats. By improving understanding of pathogen behaviour and aligning research with real-world needs, this work supports effective disease management, protects yield and fibre quality, and helps ensure a resilient and sustainable cotton industry.

How will this work benefit Australian cotton growers and industry?

The ACDC delivers direct value to Australian cotton growers and the broader industry by:

- **Driving profitability and resilience** through innovative, applied research that generates practical on-farm solutions and more effective disease management strategies.
- **Building national capability** by training skilled researchers and practitioners equipped to tackle current and emerging cotton disease threats.
- **Strengthening collaboration and accelerating impact** through a co-innovation model that brings together growers, industry partners, and research organisations to ensure solutions are relevant, scalable, and adopted.

True to its name, the ACDC unites expertise from multiple institutions and industry representatives to address cotton disease challenges collectively. Through early-career development and higher-degree research training, it builds the long-term capacity needed to manage disease risks now and into the future. This ensures growers have access to improved knowledge, predictive tools, and support systems that enhance productivity and safeguard the sustainability of the Australian cotton industry.

