

MSc Scholarship in Coffee Varietal Trialling

2021-2022

Title:

Background:

The Australian Coffee grower industry generates a unique product from a small footprint. Established over the past 30 years it has successfully created a distinct niche, delivering high quality product to small domestic, tourist and specialist export markets. However, over 99% of the coffee consumed in Australia is roasted from imported beans, and major Australian cities now boast one of the most sophisticated coffee cultures worldwide. This presents significant market opportunities for Australian grown beans. Increasing the size of the industry is dependent upon attracting new investors who see the value of Australian-origin coffee as a -niche product, both nationally and globally. This requires access to new cultivars that decrease the cost of production, are not susceptible to the major diseases of coffee that are found in the major coffee producing regions and sustain or increase quality and the unique attributes of Australian-grown coffee. The variety on which the local industry is currently based is the K7 variety of *Coffea arabica*. While K7 produces high quality beans, is high yielding and rust resistant, it has proven to be too vigorous in the fertile soils and warm, wet climate of the Australian subtropics and requires repeated pruning which results in loss of production. A new semi-dwarf variety that requires less pruning but that has the same or better quality in the cup is urgently needed.

The replacement variety should be of equal or higher quality and eliminate mandatory pruning, a practice currently used by Australian coffee growers to control excess vigour.

This project brings together a suite of novel, globally sourced, elite *Coffea arabica* germplasm for the selection of best performing cultivars to reinvigorate Australian coffee and to build confidence into the future of the Australian coffee grower industry.

Experimental approaches:

In this project, a unique collection of 25 international *Coffea arabica* varieties will be characterized phenotypically and genotypically to identify a potential replacement variety for the local coffee industry.

The work will include:

- 1) Critical review of existing relevant peer-reviewed scientific literature
- 2) Detailed assessment of phenotypic variation and agronomic performance of a diverse collection of *Coffea arabica* under local field conditions
- 3) Detailed genotypic analysis of *Coffea arabica* for genetic fingerprinting, phylogenetics and diversity analysis
- 4) Establishment of tissue culture methodology for vegetative propagation of *Coffea arabica*

This research opportunity will contribute to an Agrifutures project

Training:

This studentship would be suitable for a graduate in biological or agricultural sciences and will provide training in:

- Sampling strategy and experimental design
- Plant Phenotyping
- Genotyping
- Report writing

This MSc candidature will be managed within the SCU postgraduate training programme in Plant Science Innovation (<https://www.scu.edu.au/research-centres/southern-cross-plant-science/postgraduate-training-program/>), which provides opportunities to benefit from a broader range of professional training alongside the focused research project.

Links to ongoing work and potential collaboration:

Southern Cross Plant Science is a Research Centre within **Southern Cross University** (SCU), and carries out research underpinning the selection, cultivation and utilization of plants. SCPS infrastructure includes facilities for plant growth,

analytical chemistry, high-throughput DNA sequencing, genotyping, proteomics and bioinformatics. SCU has achieved the highest rating of exceptional performance, well above world standard in the past two national assessments of research excellence (2012 and 2015) for crop and pasture production and agricultural science.

Application:

Deadline is 1st November 2020

Applications should contain an up to date resume (CV), a cover letter (outlining interest and suitability for the proposed project and contact details of two referees (to obtain letters of reference) and sent via e-mail to SCU contact.

Scholarship:

SCU stipend for 18 months at \$28,000 per annum

This project will be based at SCU's campus in Lismore, NSW, Australia.

Specific Requirements:

A valid drivers licence is needed to carry out work under this proposed project

SCU Contact: Associate Professor Tobias Kretzschmar, Professor Terry Rose

E-mail: tobias.kretzschmar@scu.edu.au; terry.rose@scu.edu.au