

PhD Opportunities: Tropical Protected Cropping & Indigenous Hydroponics



The Research Institute for Northern Agriculture ([RINA](#)) is seeking applicants for an exciting PhD opportunity focused on advancing tropical protected cropping systems and hydroponic production in Northern Australia. This project will investigate innovative approaches to growing temperate leafy greens and Indigenous plant species under challenging tropical conditions, with the aim of improving local food production, supporting Indigenous enterprises, and strengthening food system resilience in the Northern Territory. This project offers **two** PhD scholarship opportunities.

Scholarship and financial support:

For Domestic Candidates

- Research Training Program (RTP) stipend (\$35,489 per annum from 2026, indexed annually and tax exempt) for up to 3 years from commencement, open to Australian citizens/residents or New Zealand citizens (domestic students).
- RTP Fee Offset (full tuition fee waiver)
- Stipend top-up of \$16,000 per annum for 3 years
- Relocation assistance may be available for up to \$2,000

For International Candidates

- Full tuition fee waiver
- Stipend of \$35,489 per annum from 2026 (indexed annually) funded by the project for 3 years
- A maximum of one international appointment is available. Students will need to demonstrate outstanding academic performance.

About the project:

Northern Australia faces significant challenges in producing reliable, affordable, and locally grown fresh food due to extreme climate, biosecurity pressure, and supply chain dependence on southern Australia. Novel protected cropping technologies offer a pathway to overcome these constraints by improving crop resilience, water efficiency, and productivity under tropical conditions.

This project will evaluate and demonstrate Orlar International's microbial-active hydroponic system, combining advanced greenhouse design, substrate technology (Orlarock), and microbial consortia to support the cultivation of both temperate leafy greens and Indigenous plant species in the Northern Territory.

The project is a collaboration between Charles Darwin University (CDU) and Orlar International, with links to Indigenous bush food enterprises and broader food system development initiatives in northern Australia. The project is funded by Future Food Systems CRC.

We are recruiting **two PhD candidates** to work as part of a closely integrated research team, collaborating with academic supervisors, industry partners, and technical staff:

Position 1 – Tropical Protected Cropping and Hydroponic Systems

Focus on system performance, greenhouse climate management, crop productivity, and scaling of hydroponic systems under tropical conditions.

Position 2 – Microbial Enhancement of Hydroponic Indigenous Crops

Focus on microbial consortia development, plant–microbe interactions and improving yield and quality (including active compounds) of Indigenous crop species.

Both students will work at CDU Casuarina in Darwin within an integrated experimental program combining greenhouse trials, microbial analysis, and industry translation. **The two PhD candidates are expected to collaborate closely** throughout the project and contribute collaboratively to shared research activities.

About you:

- You have a research background in a relevant discipline such as agricultural science, horticulture, soil/microbial biology, plant physiology, controlled environment agriculture, environmental science or related fields.
- Skills or an interest in developing skills in one or more of the following fields:
 - Hydroponics and protected cropping systems
 - Plant physiology and crop production
 - Microbial ecology / plant–microbe interactions
 - Laboratory analysis (e.g. plant compounds, microbial profiling)
 - Environmental monitoring or greenhouse systems
- Strong motivation to work in an industry-linked, applied research project
- Would ideally be based or willing to relocate to Darwin.

Benefits to you:

- Generous financial supports for project costs and stipend top-up (for domestic candidates)
- Opportunity to work on cutting-edge tropical hydroponic systems
- Direct collaboration with industry partner (Orlar International)
- Engagement with Indigenous enterprises and food systems development
- Strong pathway to impact in agriculture, sustainability, and food security
- Development of skills in controlled environment agriculture, microbial technologies, crop physiology, and tropical greenhouse systems
- Opportunity to contribute to scaling innovation across Northern Australia and Southeast Asia
- Access to Student Support Services and Wellbeing Support Program
- Supportive, multidisciplinary research environment at CDU

Selection criteria:

- First Class Honours or equivalent in agricultural science, horticulture, plant science, microbial biology, or related fields

- Experience with protected cropping, plant-microbe interactions, or indigenous bush food are highly desirable
- Demonstrated ability or willingness to:
 - Undertake greenhouse and experimental work in tropical conditions
 - Work effectively in a collaborative research team environment
 - Engage with industry partners and multidisciplinary stakeholders
 - Contribute to shared experimental design, data collection, and reporting
 - Contribute to project reporting
- Must meet CDU [PhD entry requirements](#)
- Must meet the [RTP \(domestic or international as relevant\) scholarship requirements](#)

How to apply:

Email an expression of interest to Prof. Stephen Xu (stephen.xu@cdu.edu.au) including:

- A curriculum vitae, including a list of any peer-reviewed publications, conference presentations and relevant work and/or research experience
- A brief statement, not exceeding 500 words, describing your background, research experience and interest in this research project/area
- Names and contact details of two academic referees
- Academic transcript
- Sample writing work like first-authored publications, thesis, project report, etc.

Application closing date: 11:59pm (AEST) 1st August 2026

Commencement date: March 2027

Supervisory and Advisory Team: Stephen Xu (CDU), Lyndal Hugo (Orlar International)

Enquiries: Professor Stephen Xu (stephen.xu@cdu.edu.au, 0423 261 276)

Diversity and Inclusion: At CDU, we actively celebrate our diversity. We innovate, embrace new ideas, and act with courage and kindness. We're about what we can give to the world rather than what we take, and we believe in the transformative power of education. We work hard to make sure every member of our university community feels that they truly belong. Understanding that it is through our focus on our people and leveraging our differences that will make CDU the most connected university in Australia, we are striving to ensure that our culture and our community are inclusive of all our staff, students and visitors. We are committed to maintaining a culture where everyone feels respected, safe, encouraged to speak up and supported in achieving their professional goals. You make CDU. And we want you to be exactly who you are.