IMPACT EVALUATION

Tropical orchard production

Project: A.2.2021052.1
Demonstrating next generation resilient orchard production systems for tropical crops

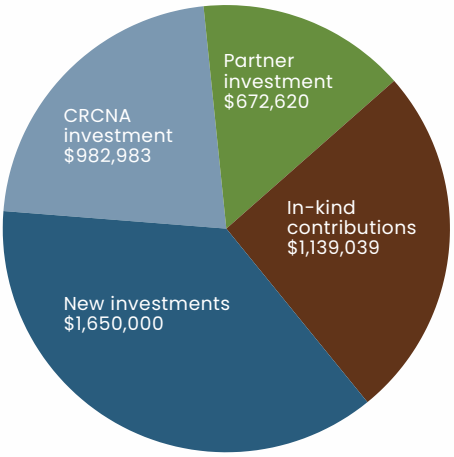
Research program:
2 – New and developing industries in northern Australia

Project timeframe:
2020 to 2024

Partners:
- Queensland Dept. Primary Industries
- NT Dept. Agriculture and Fisheries
- WA Dept. Primary Industries and Regional Development
- NT Farmers Association
- GrowCom
- Manbulloo Limited
- Aus-Ex

Project locations: Mutchilba, Bellenden Ker, Townsville, Darwin, Katherine, Carnarvon, Kununurra

Project return on investments:



Return on investment to date has been at least a 3.35 times return on the CRCNA's investment of $982,983.

Jobs created:

5.25 FTE years during the 4 year project.

Project summary:
Diversifying crop production in northern Australia is important for building a more resilient and economically sustainable agricultural sector.

Although many tropical tree crops can grow well in the region, expansion has been constrained by the high cyclone risk, which makes traditional low-density orchards vulnerable to damage and loss.

This project explored alternative orchard systems designed to reduce that risk, focusing on high-density plantings and trellis-based production methods that could eventually replace conventional orchard designs.

Using jackfruit as a model crop due to its strong production potential across much of northern Australia, the project assessed whether these next-generation systems could improve productivity, profitability and cyclone resilience in tropical conditions.

The findings aim to support resilient expansion of horticulture across the north.



Project impacts to date:

Increases in production:

- Australia's small but emerging jackfruit industry has gained stronger foundations for future growth through this project.
- Commercial grower partners in NT and Qld established trial plantings using high-density orchard systems, trellising and improved propagation methods, with early plantings fruiting by 2025.
- Around 1,000 new jackfruit trees have been planted since the project began, including approximately 250 in NT and 750 in Qld, expanding commercial production capacity.
- The project improved access to quality planting material, addressing a key barrier to industry growth.
- Queensland: Private nurseries have commenced trial production of clonal jackfruit plants, demonstrating early commercial uptake of the project's propagation research.
- Northern Territory: Tissue culture research developed a propagation methodology with potential to reduce the cost and time required to access improved genetics for future plantings.
- Western Australia:Trials at Kununurra and Carnarvon advanced knowledge of high-density orchard systems, locally adapted varieties and management practices, with potential benefits for other tropical tree crops.
- Kununurra: 46 of 48 Galaxy seedlings survived, although freestanding trees showed greater early vigour than trellised trees.
- Carnarvon: Local GUG and MOR varieties showed promising growth and fruit set, with trials improving understanding of irrigation, sunburn, wind and disease management.

New investment facilitated:

- The project helped catalyse at least $1.65 million in follow-on public and private investment to further develop Australia's emerging jackfruit industry.
- In the NT, the CRCNA project helped de-risk future investment by establishing foundational agronomic knowledge, industry capability and grower confidence in jackfruit production systems.
- This contributed to a $1.3 million AgriFutures Australia project to develop ready-to-market jackfruit products and support Australian market growth, involving commercial growers and processing partners.
- Project knowledge also informed broader national research on emerging crop production systems, including genetic investment planning and technology mapping for future agricultural innovation.
- In Qld, jackfruit was included in a DAFF AgVet chemicals program for emerging industries, creating a pathway to improved pest, weed and disease management tools, with project funding capped at $350,000.
- These follow-on investments demonstrate confidence in the commercial and research potential of jackfruit, extending the impact of the CRCNA project beyond its original timeframe.



Jobs created:

- In NT, project-supported roles continued beyond completion, retaining specialist tropical horticulture capability in regional northern Australia.
- A project-supported PhD candidate completed their research and secured permanent employment in the Katherine horticulture team, strengthening long-term regional capability.
- The project also supported workforce development, with staff progressing into more senior technical and research roles across the north. In WA, the trials also strengthened DPIRD's applied research knowledge in jackfruit propagation, climate-specific orchard management and evaluation of locally adapted varieties, providing a foundation for future grower extension and research.
- Beyond direct employment, the project strengthened local capacity to deliver horticultural research, extension and future industry development across northern Australia.



Projected impacts beyond 2026

- Continued expansion of commercial jackfruit production across northern Australia as new orchards reach maturity over the next 5–10 years.
- Potential adoption of high-density systems, improved propagation and, where economically justified, trellising, subject to longer-term evaluation of productivity, labour requirements and cyclone performance.
- Increased private investment in nursery production and improved planting material to support faster industry growth.
- Improved access to superior clonal genetics, lifting orchard productivity, fruit quality and commercial consistency over time.
- Stronger regional tropical horticulture research and extension capability to support growers and future industry development.
- Application of WA and eastern-state findings beyond jackfruit, including locally adapted planting material, orchard establishment, irrigation, sunburn and disease management for other tropical tree crops.
- Better-informed preparedness for severe weather and climate variability, while recognising that the cyclone resistance of WA trellis systems has not yet been demonstrated in an actual cyclone.
- Further research and commercial investment in emerging tropical horticulture, building on capability and grower confidence established through the project.

Access full project details and reports:
crcna.com.au/projects/demonstrating-next-generation-resilient-orchard-production-systems-tropical-crops/





DEVELOPING NORTHERN AUSTRALIA

Australian Government
Department of Industry, Science and Resources

Cooperative Research Centres Program

Research for **sustainable** and **inclusive** development of **northern Australia**.

Gurambilbarra Country, Wulgurukaba and Thul Garrie Waja Country, Bindal
Suite 5/ 281 Ross River Road Townsville Qld

CRCNA.COM.AU

CRCNA | 2026

This impact assessment has been developed in collaboration with the CRCNA and project partners. It draws on project reporting, stakeholder input and available evidence to assess project outcomes and potential longer-term impacts. Projected impacts are indicative and based on reasonable assumptions at the time of publication. Information contained in this assessment was considered accurate at the time of publishing.