2024 Highlights

Tasmanian Institute of Agriculture

UNIVERSITY of TASMANIA
TIA
Tasmanian Institute of Agriculture

Tasmanian Government

TIA is a joint venture of the University of Tasmania and the Tasmanian Government

About TIA

The Tasmanian Institute of Agriculture (TIA) is a leading research, education, and industry engagement institute dedicated to advancing agricultural and food industries.

Through innovative research and collaboration with industry, TIA focusses on enhancing productivity and sustainability to ensure the long-term prosperity of agriculture in Tasmania, with benefits extending across Australia and beyond.

In 2024, the Tasmanian Government's $6.5 million investment in TIA was leveraged to generate a research portfolio exceeding $14 million.

Research is industry-driven and addresses critical challenges faced by farmers, food producers, and processors. From improving soil health and crop resilience to advancing sustainable farming practices, TIA delivers practical science-based solutions that benefit the entire agricultural value chain.

TIA operates two nationally significant research farms in North-West Tasmania — the TIA Dairy Research Facility at Elliott and the TIA Vegetable Research Facility at Forthside. These facilities serve as hubs for cutting-edge research and education in collaboration with industry.

In addition to these dedicated facilities, TIA researchers conduct field trials across commercial orchards, vineyards, and farms across the state, working closely with producers to develop and implement best-practice innovations.

Education and training are central to TIA's mission. As the home of the University of Tasmania's agricultural teaching programs, TIA delivers the Bachelor of Agricultural Science with Honours and supports higher degree research candidates. By equipping students with the knowledge and skills needed for the future, TIA is fostering the next generation of agricultural leaders.

With a strong commitment to sustainability and innovation, TIA aims to drive positive change in Tasmania's agricultural sector, ensuring that the state remains a leader in high-quality, productive, and environmentally responsible agriculture and food production.

◂ Cover: TIA's Tree Crop Physiologist, Dr Leticia Reis.
▸ The Shed, at the University of Tasmania's Inveresk Campus.

Contents

Message From TIA's Director

As we reflect on another year of progress and achievement, I would like to extend my sincere appreciation to our stakeholders for your ongoing collaboration and support. Together, we have made significant strides in advancing agricultural research and education, delivering meaningful outcomes for Tasmania's agriculture and food industries with global relevance. Highlights include:

Advancing sustainable dairy systems

At the TIA Dairy Research Facility, we continue to make substantial progress in research aimed at reducing the dairy industry's reliance on nitrogen fertilisers. Now in its second season, the farmlet trial — delivered in partnership with Dairy Australia and guided by strong industry input — demonstrates real potential for sustainable outcomes.

Interest in this research continues to grow, both within Australia and internationally, with frequent industry visits reinforcing its importance. Stakeholders can stay informed by subscribing to our monthly project updates via the TIA website.

Driving growth in cool climate horticulture

We are proud to lead a major initiative under Hort Innovation's Hort Frontiers strategic partnership, supporting sustainable growth in cool-climate horticulture with a goal of increasing industry value by 20% by 2030.

Our team is making strong progress across multiple projects, including research focused on potato health and productivity, rotational cropping systems, cherries and berries, and vegetable seed crops.

Developing climate resilience and carbon neutrality

Developing climate-resilient agricultural practices remains central to our mission. The TAS Farm Innovation Hub, an integral part of TIA, is equipping farmers with the relationships, knowledge, and skills necessary to navigate a changing climate.

In 2024 we had 35 active research projects with a focus on drought resilience. This includes breeding drought and waterlogging resilient pasture species and crops, modelling for the various climate futures that we face, and demonstrating the value of irrigation. These initiatives are instrumental in ensuring the sustainability of Tasmania's agricultural industry.

Investing in research and education infrastructure

Our Food Safety and Innovation team recently moved into the newly constructed "Shed" at the University of Tasmania's Inveresk campus. This high-tech facility houses specialised laboratories for soil, food, sensory analysis, chemical analysis, and microbiology. Research undertaken in this space will include innovative approaches to foods of the future, including improving the safety, quality, functionality and shelf life. Teaching will commence at this facility in 2025.

Additionally, we are progressing the development of TIA's new Agricultural Research and Education Facility at the University's Newnham campus. In 2024, we secured a Development Application from the Launceston City Council, bringing us closer to a shovel-ready project in 2025. This modern facility will strengthen our research capacity, enhance climate-resilience initiatives, and address critical global agricultural challenges. It will also enrich the delivery of the Bachelor of Agricultural Science with Honours, providing students with valuable hands-on experiences to complement their learning at The Shed.

Training the next generation of agricultural leaders

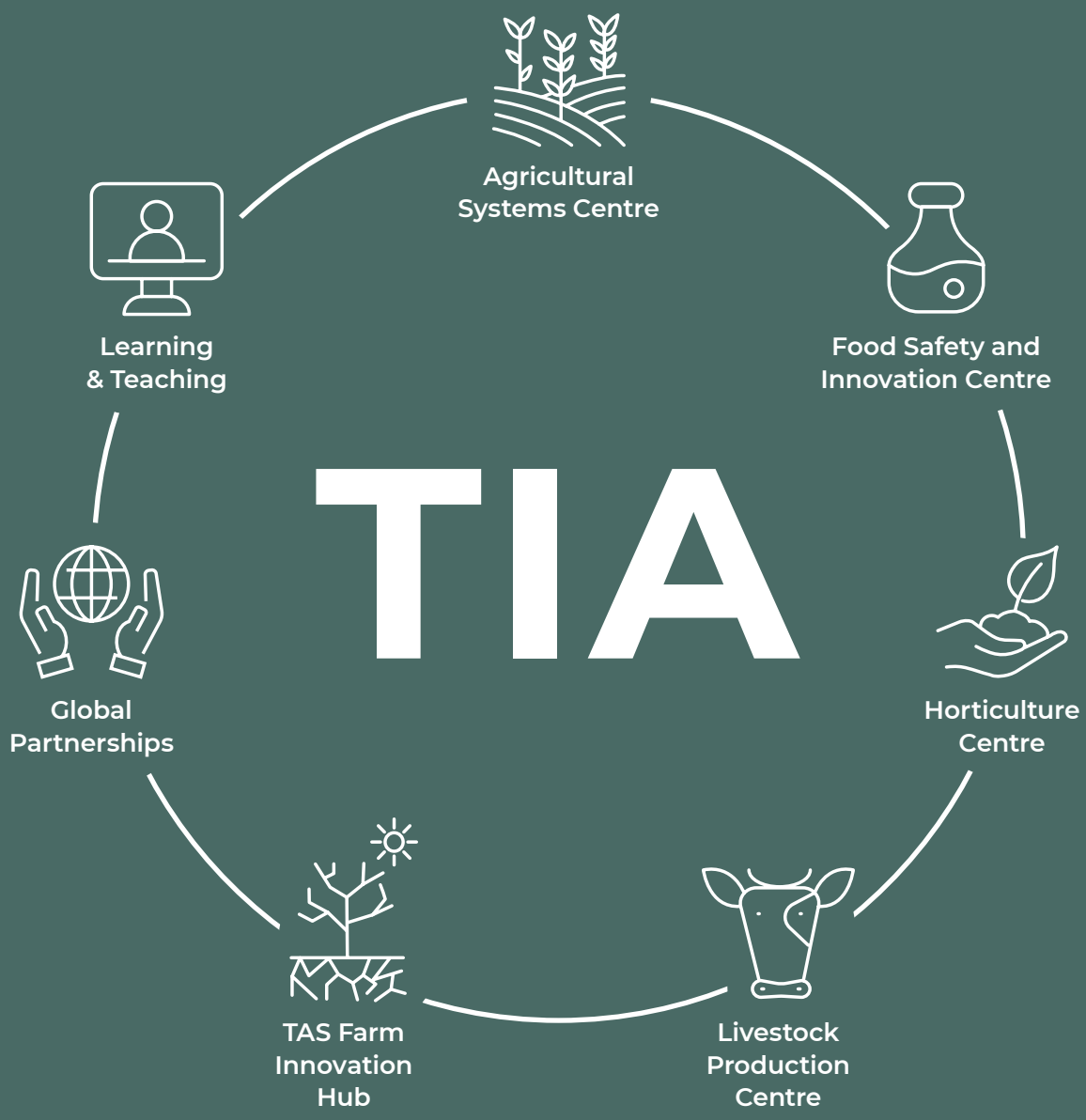
We celebrated the graduation of our new Agricultural Science students, many of whom are about to embark on their careers in the agricultural industry — whether on farms, in laboratories, at board tables, or advising governments. Our graduates are highly sought after, reflecting the strength of our programs and the industry's need for skilled professionals.

As we look ahead to 2025, we are excited by the opportunities to further enhance Tasmania's agricultural future through collaborative research, innovation, and education.

Professor Mike Rose

TIA Director

Organisational structure



Message from the Minister

The agriculture sector is the lifeblood of our State, and I was honoured to be appointed the Minister for Primary Industries and Water in 2024.

The latest Tasmanian Agri-Food ScoreCard shows that the farm-gate value of the agriculture sector in Tasmania has grown by a further 5% in 2022-23 to $2.46 billion. This demonstrates that the Government's AgriVision target of increasing the sector's farm-gate to $10 billion a year by 2050 is well on track.

Agricultural Research, Development and Extension (RD&E) is vital to achieving the AgriVision target and the Tasmanian Institute of Agriculture (TIA) remains central to the State's strategy. Since 1997, TIA has delivered world-class agricultural RD&E and education with a focus on increasing on–farm productivity and long–term sustainability for Tasmanian agriculture.

This year I was privileged to announce two new projects from the Government's Agricultural Innovation Fund, including *Growing Value from Irrigation for Tasmanian Agriculture* and an Australian-first *Zero Net Emissions Horticulture Demonstration Farm* at the TIA Vegetable Research Facility at Forthside – forming part of the broader national Zero Net Emissions from Agriculture Cooperative Research Centre (ZNE-Ag CRC).

Other exciting announcements in 2024 include the establishment of a Tasmanian Cool Climate Wine Research Hub as part of the Government's $3 million commitment to the Tasmanian wine sector. With support from the Government's Accelerating Agriculture $7 million investment to modernise our agricultural research farms, TIA is establishing a supplementary feed facility at their Dairy Research Facility at Elliott and a new greenhouse facility in the northwest of the State.

I commend Professor Mike Rose for his strong leadership over the past five years since being appointed Director of TIA in 2019. I would also like to extend my sincere thanks to all the TIA staff for their dedication to innovative and sustainable RD&E, which is vital to the future prosperity of the Tasmanian agri-food sector.

Hon Jane Howlett MP
Minister for Primary Industries and Water

Message from TIA's Advisory Board

Since 2022 it has been my pleasure to serve as Chair of the TIA advisory board and I am immensely proud of our contribution in providing advice on the strategic direction of agricultural research, development, and extension (RD&E) activities undertaken by TIA.

I am pleased to say that in 2024 the Tasmanian Government extended our agreement with the University in the TIA Joint Venture Agreement for a further five years to 2029 which continues our longstanding partnership to deliver world-class cool climate agricultural RD&E.

On behalf of the Advisory Board, we welcomed the appointment of Peter Damen as the newest industry member. All industry representatives work closely with the leaders and staff of one of the TIA Centres and Peter has immediately aligned Food Safety and Innovation. I also acknowledge the reappointment of our three other industry members – Elizabeth Skirving, Peter Skillern, and Angelique Korpershoek – who are aligned to Agricultural Systems, Horticulture, and Livestock Production, respectively. The input provided by the industry members is invaluable to the Advisory Board's work and plays a crucial role in strengthening TIA's relationship with industry across the agriculture and food value chain.

Further to this, I would like to acknowledge the valuable insight from the Board in providing advice throughout 2024 that is helping to shape the new five year TIA strategic plan currently under development.

The benefits of agricultural RD&E are often overlooked, despite its critical role in feeding the global population. TIA delivers RD&E that not only provides private benefits to Tasmanian businesses but also broad public good outcomes across the economy, environment and society. Therefore, I would like thank Professor Mike Rose for his outstanding leadership to-date and extend my appreciation to all the TIA staff for delivering such high-quality outcomes.

I am confident the Board will continue to provide strategic advice that supports the delivery of high-quality RD&E in Tasmania, and I look forward to working with the new and continuing members in the years ahead.

Mr Jason Jacobi

Chair, TIA Advisory Board
Secretary, Department of Natural Resources and Environment

Agricultural Systems Centre

Agricultural Systems Centre

We use systems approaches to analyse complex challenges and, in collaboration with industry partners, identify opportunities to enhance the productivity and resilience of Tasmania's agricultural industries.

Our focus areas include:

- Soil and water management, including irrigation, soil advocacy, and exploring indigenous women's participation in water management and governance.
- The AgTech Innovation Studio, focussing on development and proof-of-concept testing of agricultural technology.
- Agricultural systems modelling with a focus on reducing greenhouse gas emissions, adapting to hotter climates, and improving carbon storage in vegetation and soils.
- Breeding and crop physiology for resilient plants, including addressing waterlogging, increasing heat tolerance and improving phosphorous use efficiency.

Ag-Tech Innovation Studio

Project: **Ag-Tech Innovation Studio**

Research team: Simon Edwards, Dr Marcus Hardie, Dr Shane Powell, Chris Boucher, Daniel Gardner, Prof. Caroline Mohammed, Ms Claire Edwards

The Ag-Tech Innovation Studio was established in 2023 as a strategic business unit within TIA. The Studio is focussed on delivering practical, science-based technology solutions that directly address challenges faced by the Tasmanian agricultural industry.

> "Our goal is to bridge the gap between theoretical research and real-world agricultural practices, ensuring that advancements in agricultural science can be commercialised to directly benefit the industry through improved decision making, management techniques and cultivation techniques, crop management, and environmental stewardship."

The Studio works closely with growers, industry bodies, researchers, technology providers, government agencies, and the TAS Farm Innovation Hub. This collaborative approach ensures the co-design of technologies that are aligned with industry needs and tailored for practical use by growers.

Our multidisciplinary team has significant industry experience and includes research engineers, agricultural scientists, mathematicians and data engineers, supported by our lab, workshop, and prototyping facilities at the University of Tasmania's Sandy Bay campus.

We integrate scientific discoveries with cutting-edge engineering to enhance farming efficiency, sustainability, and productivity. This work ensures research outputs can move effectively from prototype to market, helping growers achieve enhanced decision-making, reduced input costs, and improved environmental management.

Our approach is collaborative, not competitive, supporting researchers (including HDR students and future research fellows), and driving co-designed innovations.

We invite growers, researchers, industry partners, and innovators to partner with the Studio to advance sustainable, resilient, and productive agricultural practices through effective technologies and applied science.

Find out more:

◂ Daniel Gardner at TIA's Vegetable Research Facility, Forthside.

▾ Simon Edwards engaging with industry about the soil e-nose.

Monitoring soil carbon with an e-nose

Project: **Microbes against climate change: A low cost electronic nose to support soil health and resilience via soil carbon sequestration**

Funding body: Tasmanian Government, through the Agricultural Development Fund

Research team: Professor Caroline Mohammed, Dr Shane Powell, Chris Boucher, Dr Muhammad Shahinur Alam, Simon Edwards, Dr Marcus Hardie, Dr Philip Young, Charissa Bensted

Research is underway to further develop a low-cost piece of equipment, referred to as an electronic nose or an e-nose, that can detect biological activity in the soil related to changes in soil carbon.

The e-nose aims to help farmers better understand on-farm carbon sequestration. It will help farmers make informed decisions about how to best manage their soil and be more productive and resilient to environmental changes.

This project builds on two previous e-nose projects that were funded by the Cooperative Research Centre for High Performance Soils. Previous work led to development of the QUOLL® which is a device that can detect many different gaseous compounds from the soil at the same time.

We are seeking expressions of interest from Tasmanian farmers and land managers that would like to take part in this project by hosting a QUOLL® e-nose on their property during 2025. These trials will find out how well the device can withstand farm conditions and test its ability to detect soil carbon dynamics.

Keep reading:

◂ Dr Simon Edwards and PhD candidate Emmaline Kinred testing the Quoll e-nose at TIA's Vegetable Research Facility.

Exploring impacts of regenerative agriculture

Project: **Towards landscape-level drought adaptation through multidisciplinary systems analysis**

Funding body: Department of Agriculture Water and the Environment, through the Future Drought Fund's Long-term Trial of Drought Resilient Farming Practices Grants program

Partners: Charles Sturt University, University of Melbourne, Grains Research and Development Corporation, Meat and Livestock Australia

Research team: Cindy Cassidy (Charles Sturt University), Professor Michael Tausz (University of Melbourne), Professor Matthew Harrison, Dr Karen Christie-Whitehead, Professor Caroline Mohammed, Dr Ke Liu

Funding for this project was provided through the Australian Government's Long-term Trials of Drought Resilient Farming Practices Program. The program supports the investigation of innovative farming techniques through science-based long-term trials, with the aim of building drought and climate resilience for Australian farmers.

During 2024, a field trial was established at Evandale in Northern Tasmania to determine if regenerative sheep grazing systems (cell grazing) contribute to drought resistance and resilience.

The research team includes modellers and social scientists who will assess the economic, environmental, and biophysical implications of cell grazing including under future climates scenarios.

Anecdotal evidence suggests that high intensity grazing for a short duration with long spelling may improve surface organic matter, recovery, and productivity.

> **"The purpose of the trial is to test whether cell grazing improves drought resilience through improvements to pasture recovery and overall productivity,"** Professor Matthew Harrison said.

"We're also looking at profitability and whether regenerative practices improve pasture production, impact soil carbon, and impact greenhouse gas emissions.

"The overall question is can we develop a farming system, a grazing management approach, or a cropping system to improve drought resilience and that's not just in one year but that's over the long term."

The TAS Farm Innovation Hub is supporting this project through industry engagement and extension.

Keep reading:

▾ Professor Matthew Harrison.

▲ Regenerative agriculture trial – high density, fixed duration treatment.

Optimising grazing for profit and sustainability

Project: DELIGHTED: Does biodiversity influence pasture production, GHG emissions or profit?

Funding body: Australian Wool Innovation

Research team: Professor Matthew Harrison and Dr Albert Muleke

Regenerative agriculture includes a range of practices like the minimal use of synthetic fertilisers, rotating livestock grazing, increasing biodiversity, improving soil carbon, and silvopasture. However, when used together, it is challenging to determine which specific practices have the greatest benefit.

The DELIGHTED project is addressing this by focusing on two key aspects: pasture species diversity and adaptive multi-paddock grazing. By testing different scenarios on four sheep farms in southern Australia, the project aims to identify which of these practices has the most significant effect on soil organic carbon accrual, greenhouse gas emissions, pasture production and farm profitability.

The findings suggest that adaptive multi-paddock grazing (high intensity grazing for short periods, with long spelling between grazing events), combined with selecting the right pasture types and adjusting livestock numbers to match pasture growth during drought, can help farmers store more carbon in the soil, reduce emissions, and improve profitability.

High-intensity, short-duration grazing had a greater positive impact on pasture growth, soil carbon storage, and farm income than simply increasing plant diversity. Shorter rest periods between grazing were generally more profitable, while longer rest periods stored more carbon in the soil.

Although adaptive grazing increased pasture growth and soil carbon, it also led to higher supplementary feed costs, which reduced overall profit per hectare. In contrast, lower-intensity grazing with shorter rest periods resulted in higher profits due to lower feed costs, making it easier to offset potential carbon taxes—especially in high-rainfall areas.

We found that climate and livestock numbers had the biggest impact on pasture growth, emissions, and farm profit. Farms with the least productive pastures and overly intensive grazing systems were generally the least profitable.

Keep reading:

Intelligent soil moisture sensor

Project: **An AI-Driven Predictive System for Soil Water Retention Function**

Funding body: Soil CRC

Research team: Associate Professor Marcus Hardie, Associate Professor Quan Bai, PhD candidate Chenting Jiang

The ability for farmers to accurately predict the soil water retention function and soil moisture dynamics is crucial for sustainable water management and precision agriculture.

This PhD project by Chenting Jiang aims to develops artificial intelligence models to enhance the efficiency, accuracy, and adaptability of predicting soil hydraulic properties using real-time soil moisture probe data.

The study integrates the Ensemble Kalman Filter (EnKF) with numerical solvers to dynamically simulate soil moisture trends and estimate soil water retention functions across multiple depths.

Additionally, a deep learning approach, leveraging Physics-Informed Neural Networks (PINNs), combines machine learning with physical laws to improve predictive accuracy.

These innovative methods enable more reliable forecasting of soil moisture and hydraulic properties while reducing the need for costly, time-intensive laboratory and field experiments.

With applications in irrigation scheduling, soil health monitoring, and hydrological modelling, this research equips farmers and land managers with advanced, data-driven tools to optimize water use, improve crop productivity, and enhance agricultural sustainability.

▾ PhD candidate Chenting Jiang undertaking field work.

Drought Resilience Adoption and Innovation Hub (TAS Farm Innovation Hub)

Funding body: Department of Agriculture Forestry and Fisheries, AgriFutures Australia and other contributing Australian Government grants

Industry partners: Beanstalk Agtech Pty Ltd; Cradle Coast NRM; Horticulture Innovation Australia; Hydro Tasmania; NRM North; NRM South; Private Forests Tasmania; Rural Business Tasmania; Southern Cross University; Tasmanian Agricultural Productivity Group; Tasmanian Institute of Agriculture; Tasmanian Irrigation; Tasmanian Land Conservancy; TasFarmers; Tasmanian Women in Agriculture Inc; TasWater; and The Derwent Catchment Project.

Delivery partners: Ag Logic; Cradle Coast NRM; East Coast Primary Producers Association; Landcare Tasmania; NRM North; NRM South; Optimum Standard; Pinion Advisory; Private Forests Tasmania; Rural Business Tasmania Inc; Regenerative Agriculture Network Tasmania; The Derwent Catchment Project; Tasmanian Land Conservancy; and TasFarmers.

TAS Farm Innovation Hub Staff: Sandra Knowles; Prof Caroline Mohammed; Dr Liana Williams; Tony Vaea; Melissa Lewarn; Marcus James; Brian Field; Prof Kathy Evans; Sophie Folder; Hannah Lewis; Erin Hughes; Sue Hinton; Maria Ortiz Rodriguez; Alex Russell; Belinda Nielsen; Alison Demuth; Jane Battersby; Dr Saideepa Kumar; Rohan Borojevic; and Renai Skurrie.

2024 was a transformative year for the TAS Farm Innovation Hub, marked by strengthened collaboration with farmers, partners, and stakeholders, working together to build climate resilience across Tasmania.

As parts of the state faced unseasonal dry conditions, the TAS Hub played a crucial role in the collective effort to prepare for, respond to, and recover from drought.

Director Sandra Knowles highlighted that the work done on King Island was particularly significant.

“We were proud to contribute to the collaborative effort supporting King Island farmers who were severely impacted by the unseasonal dry conditions,” she said.

“The Hub teamed up with the state government, local grower groups, and industry service providers to co-design and deliver targeted on-farm workshops and events, ensuring vital information reached those who needed it most.

> “It was truly rewarding to return to the Island once the situation had eased and come together with the community to reflect on the challenges they had faced and plan for a more resilient future.”

▾ Irrigated soils workshops were part of the Hub’s Water Use Efficiency Project.

▲ TAS Hub's Sandra Knowles and Sophie Folder on farm with the King Island Drought Coordinator Deb Delaney.

Other milestones for the TAS Hub included the launch of a state-wide initiative aimed at building Tasmanian producers' confidence and skills in on-farm water management. The Water Use Efficiency project, delivered by Pinion Advisory, is delivering extension events across the state, designed in response to farmer needs and tackling key issues like pre-pivot irrigator checks and navigating on-farm water storage.

The Hub is also supporting Landcare Tasmania to deliver workshops to highlight the production, ecosystem and drought resilience benefits from improved farm dam management.

In collaboration with TIA, the Hub welcomed a part-time Cultural Engagement Coordinator to focus on advancing Aboriginal engagement by building cultural awareness, fostering stronger connections, and supporting existing relationships between partner organisations and Aboriginal communities. The long-term goal is to create a foundation for deeper engagement, strengthening Aboriginal representation and participation in agriculture, and ultimately bolstering resilience within the sector. Amongst the highlights was 'tunapri luna', a symposium on Aboriginal women's knowledge held in February.

The symposium brought together women from Lutruwita and Martuwarra (West Kimberley) on the banks of the kanamaluka/Tamar River in Launceston to share freshwater and sea country connections, and issues including Aboriginal water rights and climate change impacts.

Looking ahead, the future shines bright for the national Hub network. The Australian Government's significant funding commitment of $132 million over eight years from 2024-25 will ensure the continued success of the Drought Resilience Adoption and Innovation Hubs model.

"This is fantastic news," Sandra Knowles shared. "It means the TAS Hub, alongside the other seven Hubs across the country, will be able to keep developing local solutions to enhance drought resilience, supporting farmers and regional communities for years to come."

Learn more:

Food Safety and Innovation Centre

Food Safety and Innovation Centre

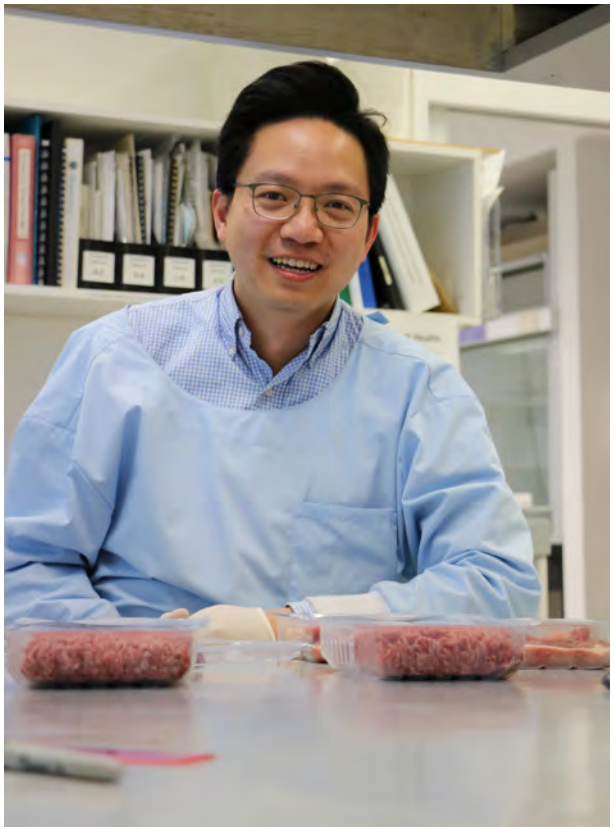
We research and deliver innovative solutions to improve the safety, quality, functionality, and shelf life of food. Our team are acknowledged around the world for their expertise in the microbiology of food production systems.

Our work supports the food industry in Tasmania, nationally, and internationally, by providing innovation, actionable knowledge, and solutions to add value, safety, and sustainability to produce.

Our focus areas include:

- Food safety and quality, including pre and post harvest interventions, predictive modelling and quantitative risk assessment.
- Innovative processing, including shelf life extension, value adding, suply chain logistics, and circular economy.
- Microbiology teaching program

▾ TIA Senior Research Fellow, Dr Jay Kocharunchitt.



Opportunity to extend shelf-life of vacuum-packed lamb

Project: **Extending the shelf-life of vacuum-packed sheep meats**

Funding body: Meat and Livestock Australia

Research team: Dr Jay Kocharunchitt, Professor Tom Ross, Professor John Bowman, Dr Joanne Pagnon, Dr Lyndal Mellefont, Dr Laura Rood

This project resulted in the identification of a practical and cost-effective approach for extending the shelf life of vacuum-packed (VP) lamb through the application of glucose and lactic acid.

The project ran from 2021 until 2024 and expanded upon previous MLA-funded projects. The aim was to further understand the microbiology of VP lamb spoilage to assist the development of an innovative and practical strategy to reliably produce a product with a shelf-life longer than 90 days in cold chains.

A range of factors that can affect the shelf life of red meat were investigated including meat pH, glucose, lactic acid and the presence of bone marrow and fat. It was found that the application of glucose and lactic acid can extend the shelf life of VP lamb.

> **"This method has real potential to be developed into a practical and cost-effective approach for the Australia red meat industry to expand the shelf life of VP lamb,"** Project lead, Dr Jay Kocharunchitt said.

The fundamental knowledge developed during this project will support future research to refine targeted approaches to increase the shelf-life of lamb.

Keep reading:

Predictive model for shelf life of red meat products

Project: **Development of shelf life models for beef, lamb and pork**

Funding body: Meat and Livestock Australia

Research team: Dr Jay Kocharunchitt, Professor Tom Ross, Professor John Bowman, Dr Joanne Pagnon, Dr Laura Rood

During 2024, a new web-based tool was launched to provide Australia's red meat industry with a rapid and accurate prediction of the remaining shelf life of red meat products

The web-based tool was developed by a research team led by Dr Jay Kocharunchitt and can assist with decisions on product movement, support quality assurance, and ultimately contribute to reduced food waste.

The user-friendly interface, known as the MLA Shelf-life Calculator, provides a rapid and accurate assessment of the shelf life remaining for Australian vacuum-packed beef and lamb cuts

"This support tool brings innovation to the Australian red meat industry. We are one of the world's largest exporters of red meat and export to over 100 countries, so reducing food wastage is important for the sustainability of the industry," Dr Kocharunchitt said.

"The tool also allows industry to demonstrate to customers that their product meets a certain specification. It will help maintain the quality reputation of Australian red meat producers."

Access the tool online:

◂ Dr Laura Rood was part of the research team.

PhD advances existing knowledge of red meat spoilage

Project: Understanding potential mechanisms of red meat spoilage

Funding body: Meat and Livestock Australia and TIA

Research team: Dr Jay Kocharunchitt, Professor John Bowman, Dr Laura Rood

Elerin Toomik is undertaking a PhD to understand why the shelf life of vacuum-packed (VP) lamb meat is much shorter compared to the shelf life of VP beef when stored at chill temperatures.

The shelf life of red meat is determined by microbial growth and metabolism, which is influenced by a range of factors including meat properties (e.g. pH, glucose content, and fat tissue content), storage conditions, and temperature.

Lamb typically has higher pH than beef which could contribute to its shorter shelf life. However, a recent study has found that even when factors like pH and glucose content are similar, lamb still has shorter shelf-life.

Elerin investigated the compounds that bacteria utilise and produce, focussing on the metabolic profiles of beef and lamb cuts that have similar pH levels but a different shelf life.

She found that both meat types likely spoiled due to amino acid degradation, where bacteria produce off-odour compounds. The shorter shelf-life of lamb could be explained by bacteria producing more offensive odours from sulphurous compounds. These are detectable by consumers at much lower concentrations and have more pronounced impact on the meat odour profile.

These research findings are presented on a poster that landed Elerin the first place at the Australian Institute of Food Science and Technology's 2024 Conference which was judged on originality, research quality, scientific or commercial value, and presentation.

Elerin also conducted a shelf life trial looking at the effects of fat content on beef and lamb mince, as lamb typically can have higher fat content than beef which could contribute to a shorter shelf life. There is currently limited research investigating the effects of fat on the pH and spoilage of VP red meat.

She found that the addition of fat negatively impacted the shelf-life of VP beef and lamb mince. Moreover, the shorter shelf life was accompanied by a decrease in glucose and lactic acid levels and increases in pH levels and bacterial growth rates.

The differences between lamb and beef are poorly understood and this research significantly advances existing knowledge of red meat spoilage. These findings could lead to the development of novel approaches to assure or extend the quality shelf-life of VP red meat.

View Elerin's winning poster:

▾ TIA Phd candidate, Elerin Toomak.

▲ Masters student Ramida Varahakaporn.

Inaugural recipient of Professor Tom McMeekin Prize

The inaugural Professor Tom McMeekin Prize was awarded in 2024 to Masters of Agricultural Science and Food Science student Ramida Varahakaporn.

Ramida was recognised for her outstanding Masters research thesis on the impact of cold storage and second-grade fruit on the quality of freeze-dried strawberries.

Her research has potential to reduce the amount of food waste in Australia through the development of a new product.

“There’s over seven-million tonnes of food waste in Australia every year. I want to divert some of that that into a new product that’s of good quality and accepted by consumers,” Ramida said.

The prize was established to encourage students into food microbiology or food safety research at the University of Tasmania, and to honour Professor McMeekin’s memory and legacy. Professor McMeekin is acknowledged as one of the world’s leading food microbiologists and his expertise established new systems of improving food safety around the world.

The prize was established by a generous donation made by Professor John Bowman, Centre Leader for Food Safety and Innovation at TIA. Members of Professor McMeekin’s family and former colleagues have also donated to the prize in honour of Tom’s legacy.

Find out more:

▲ Official opening of The Shed in 2024.

Science in The Shed

October 2024 saw the official opening of The Shed, the final and largest building of the University of Tasmania's expanded Inveresk campus in the heart of Launceston.

The Shed is home to TIA's Food Safety and Innovation Centre and will play an important role in training our future agriculture and food scientists as well as enabling world-class food science research.

TIA's new chemical analytical laboratory expands our capabilities to analyse and test food products including items that wouldn't otherwise be sampled by a human sensory panel such as spoiled meat.

Specialised equipment in this space includes a substantial suite of aroma and flavour measurements and an electronic tongue which mimics human tastebuds to provide objective taste assessments.

This creates opportunities for new and innovative research to measure changing flavours, help producers and manufacturers develop new crops and products, identify possible substitute ingredients in food, and even help people choose what they want to eat or drink based on taste profiles.

Another new space is our food research laboratory, which offers a clean and controlled environment to prepare food that is safe for consumption. Research undertaken in this space will include innovative approaches to foods of the future, including improving the safety, quality, functionality and shelf life of food.

Complementing this is our sensory laboratory, which provides a dedicated space to evaluate the sensory properties of food products in an environment that is controlled, standardised, and isolated from external distractions. Sensory analysis is an important part of food research and development and focus areas include taste, smell, texture and appearance.

◂ The Shed, at the University of Tasmania's Inveresk Campus.

Horticulture Centre

Horticulture Centre

We aspire to be the nation's leading provider of cool climate horticulture research, development, extension and adoption. Our work contributes to the goal of growing the farm gate value by 20 per cent over the next five years to 2030.

Our focus areas include:

- Sustainable resource use
- Technological and digital innovation
- Pest and disease preparedness and responsiveness to mitigate risks
- New crops, products and processes

We operate the TIA Vegetable Research Facility at Forthside in North-West Tasmania. This 54-hectare site is the location of diverse research trials and teaching that directly contribute to the sustainability and productivity of Tasmania's agriculture industry.

Forthside is also the base of the Tasmanian Certified Seed Potato Scheme, which provides an independent service to ensure that seed potatoes are grown in accordance with a strict national standard. The scheme helps to ensure that only clean potato seed enters the industry, which helps to control the spread of pests and diseases.

Managing botrytis bunch rot disease

Project: **Fast-tracking solutions for reliable and climate-responsive wine grape production (the Botrytis Project)**

Funding body: Tasmanian Government, through the Agricultural Development Fund

Industry partners: Wine Tasmania, Nufarm, Australian Wine Research Institute, and collaborating Tasmanian wine businesses

Research team: Professor Kathy Evans and the late Dr David Page.

Botrytis bunch rot disease continues to be a major production constraint at many wine growing sites in Tasmania. A TIA research team, led by Professor Kathy Evans, is working with industry to address the problem and boost productivity and profitability for wine growers.

▲ Professor Kathy Evans and Botrytis bunch rot disease on wine grapes.

Wine producers from nine Tasmanian vineyards participated in the first season of the trial which concluded towards the end of 2024. The producer-led trials involved participants selecting a botrytis management practice and conducting simple in-vineyard trials that are suited to their specific vineyard and business.

The TIA project team provides support during the trial from idea to data collection and interpretation. An important part of this project is the sharing of results with participants and the broader sector, and a series of YouTube videos was launched in 2024 to highlight successes and practical implementation.

Wine producer Dr Andrew Pirie has participated in the research process at his Apogee vineyard near Lebrina in northern Tasmania with a good improvement in botrytis control in Chardonnay grapes for the 2024 vintage.

"The trial is conducted over a small 0.3-hectare area which covered our chardonnay plot. We made an extra $5000 from that area this year because we didn't have the problem of managing botrytis. You multiply that over a larger area and it's a very significant saving," Dr Andrew Pirie said.

Keep reading:

▲ Professor Calum Wilson.

Tackling potato disease

Potatoes are the most valuable sector of the Tasmanian vegetable industry, with a farmgate value of more than $370 million, a figure that grows significantly with value added processing.

TIA's plant pathology team have been working for many years to support this important industry and provide solutions for diseases that impact profitability and sustainability.

The team works in close collaboration with local and international industry partners on a number of research projects focussed on key disease challenges for the Tasmanian and global potato industries.

Our highly novel approaches will provide unique and sustainable disease management solutions, and a milestone was achieved in 2024 with some concepts receiving patent protection.

Here's a glimpse at a couple of projects we're working on.

Project: Manipulation of the soil chemical ecology for plant disease prevention

Funding body: This project is being delivered through Hort Innovation's Hort Frontiers strategic partnership initiative

Industry partners: Potatoes NZ, Simplot Australia, McCain Foods

Research team: Professor Calum Wilson, Dr Jonathan Amponsah, Dr Iain Kirkwood (PNZ), Paula Lleras (PNZ), Dr Audrey Leo (Simplot), Sarah Newton (McCain Foods), Ellie Brock (Master candidate, Lincoln Uni) and Thi Thanh Nguyen (PhD candidate)

Powdery scab is a potato disease that reduces potato yield and tuber quality by impairing root function and forming unsightly skin blemishes on tubers. Diseased tubers are obviously less attractive to consumers but also require additional peeling and affect storage for processing crops.

The disease is a significant threat to sustainable production globally with no single treatment offering adequate control. The pathogen is also very persistent and challenging to control and can survive in contaminated soil for decades. This disease is rated as the number one research priority for the Australian potato industries.

Our research aims to develop and validate novel non-fungicidal soil treatments to target soil inoculum and prevent infection of potato crops.

The research aims to reduce disease and rejection levels and allow potato crops to be planted more frequently in the same soil. This has the potential to improve both the environmental impact of potato production and he economic return to growers.

In 2024, trials conducted in Tasmania and New Zealand have reinforced disease suppression and yield enhancing outcomes observed from prior years. Growers have begun adopting the preliminary treatment options commercially.

New results from controlled testing suggest additional treatments, including utilisation of waste products from the processing factories show tremendous promise and disease ameliorating soil treatments. Work towards the development of formulations that could be used commercially are underway.

Project: Development of a decision support system for management of potato diseases and estimating impact of changing climates

Funding body: Department of Natural Resources and Environment Tasmania, through the Agricultural Development Fund

Industry partners: Simplot Australia

Research team: Professor Calum Wilson, Dr Jonathan Amponsah, Dr Jason Scott, Dr Audrey Leo (Simplot), Frank Mulcahy (Agronomist) and Hina Akram (PhD candidate)

The Tasmanian potato industry relies on prophylactic pesticide applications to control disease, however it's not fully understood how soil-borne diseases develop and change over time.

This project will investigate and model the dynamics of important potato diseases to better inform grower decision making.

Disease predictive tools enable growers to make informed decisions about the efficient use of pesticides and improved, tailored disease control measures. This can increase the productivity and profitability of the Tasmanian industry, whilst decreasing food waste, pesticide use and environmental impacts. It can also provide a valuable tool for modelling the impact of future climate change.

This project will adapt and validate existing models under Tasmanian growing conditions for the two major foliar diseases (early and late blight) enabling foliar sprays to be targeted to critical infection periods.

The research team will then develop prediction and monitoring systems for the key soil-borne diseases (powdery scab and pink rot), for which there is currently little understanding of the dynamic drivers of disease development and little opportunity for strategic disease intervention.

In 2024, the second season of field data was collated from across major production regions. Where foliar disease was noted, the models tested were able to determine major infection events.

Disease progression in potato roots were monitored providing the first data on dynamics of pink rot and powdery scab epidemics in commercial fields.

Association analyses showed initial pathogen inoculum to be a key driver of powdery scab, whilst soil moisture levels were critical for pink rot. Other soil parameters had varying impact on disease progression.

PhD student Hina Akram also commenced her PhD studies where she is examining the role of soil moisture and temperature dynamics on pink rot disease.

▾ Potato flowers.

Research Hub for Traditional Chinese Herbs

Project: **Research Hub for Traditional Chinese Herbs**

Funding body: Australian Education Management Group

Industry partners: Nanjing University of Chinese Medicine, Marleen Herbs of Tasmania, and Gould's Natural Medicine Organic Herb Farm

Research team: Professor Dugald Close, Dr Alieta Eyles

Established in 2019, the Research Hub for Traditional Chinese Medicinal Herbs is driving the development of a new agricultural industry for Tasmania, focused on producing and processing premium quality medicinal herbs.

Researchers are assessing the potential of seven crops for cultivation in Tasmania to meet the stringent quality standards of the Traditional Chinese Medicine market — an industry valued at approximately $130 billion annually.

Among these crops, Mongolian Milkvetch has shown strong potential, prompting a larger commercial-scale trial at the TIA Vegetable Research Facility in Tasmania's North-West.

Early proof of concept studies indicate that Tasmania's soils and climate support the production of medicinal herbs with the desired bioactive compounds.

The next phase of research refine practical aspects of cultivation, including optimal planting density, irrigation, nutrition, pest and disease management, soil preparation. The team is also evaluating the economic viability of Mongolian Milkvetch to determine its potential as a high-value crop for Tasmanian farmers.

"There are estimates that the TCM industry will almost double in the next 10 years so there's great potential for Tasmania to play a role in the expansion of what is already a very large industry," says Professor Dugald Close, Project Lead.

Keep reading:

◂ Team at TIA Vegetable Research Facility planting a TCM trial.

◂ TCM trial at TIA Vegetable Research Facility.

▲ Dr Jason Scott at the weed poppy trial at the TIA Vegetable Research Facility at Forthside.

Weeding out unwanted poppies

Project: **Control of weed poppies in commercial poppy production**

Funding body: Tasmanian Government, through the Agricultural Development Fund

Industry partners: Poppy Growers Tasmania, Extratas Bioscience, SunPharma

Research team: Dr Jason Scott, Dr Tamieka Pearce, Pattie Weichelt

This research project will develop new strategies to control weed poppies, a major challenge for Tasmania's opium poppy industry.

Tasmania supplies nearly half of the world's licit alkaloid material for pharmaceuticals, making effective weed management critical for production.

Weed species such as Rough Poppy, Long-headed Poppy, and Corn Poppy compete for resources and contaminate harvests. Current herbicide options are limited due to the close genetic relationship between opium poppy and weed poppies.

The first phase of research will test herbicides at trial sites in Sassafras, Deloraine, Hagley, and Red Hills to identify effective chemical control options. The second phase will develop a false seed bed preparation method to encourage weed seed germination between crops, allowing early elimination before planting.

Poppy Growers Tasmania CEO Howard Nichol emphasized the project's importance, stating that weed contamination reduces profitability.

"This research project is another great example of poppy growers and processors, Government and TIA working collaboratively to enhance productivity, sustainability and importantly profitability within the poppy industry," he said.

The research will provide practical, evidence-based weed control solutions, enhancing the industry's productivity and sustainability.

Find out more:


MONTAGUE
13
MONTAGUE
13

Boosting sustainability and profitability of Australian orchards

Project: **PIPS 4 Profit: Optimising apple and pear production systems and Building sustainable soils**

Funding body: Hort Innovation. This project has been funded by Hort Innovation using the apple and pear research and development levy and funds from the Australian Government.

Industry partners: R&R Smith Orchards, Montague Farms

Research team: Associate Professor Nigel Swarts, Dr Ramandeep Singh Sidhu, Dr Leticia Reis, Professor Dugald Close, Trong Hieu Do, Michele Buntain, Dr Brianna Walker

The Productivity, Irrigation, Pests and Soils (PIPS) program was established in 2009 to deliver whole-of-orchard system research, development and demonstration. The current phase of PIPS4 Profit (2023–2028) involves four national research projects, with TIA leading two of these projects in collaboration with industry partners.

This research aims to strengthen orchard profitability and support the growth of Tasmania's apple sector, which has a farm gate value of $68 million (Agrifood Scorecard 2022–23).

Optimising apple production systems

We are investigating alternative crop load management practices and technologies to reduce the reliance on costly hand thinning. Tasmanian growers have identified the need for more reliable and predictable thinning strategies as a top priority.

In October 2024, three trials were established at a 42-hectare commercial orchard at Legana, northern Tasmania, involving Jazz, Buckeye Gala and Ambrosia apple cultivars. These trials aim to develop an effective thinning program that reduces costs, improves fruit production and quality, and decreases biennial bearing.

Led by Tree Crop Physiologist, Dr Leticia Reis, the trials examine the effect of different thinning practices and explores the use of alternative thinning agents to support more sustainable orchard management practices.

"Crop load management is critical for ensuring consistent production of high-quality apples. Effective thinning helps achieve target fruit size with minimal labour, while ensuring that flower development for the following year is not compromised," Dr Reis said.

◂ Apple harvest at Montague Farms orchard.

▴ Dr Leticia Reis during apple harvest at Montague Farms orchard.

In 2025, the research team will continue conducting trials, spraying, hand thinning, harvesting, and collecting data to inform best practices.

Building sustainable soils

This research explores the effect of tree-line management strategies, including living and organic mulches, on soil health and orchard productivity.

Trials in southern Tasmania, led by Research Fellow in Tree Crop Physiology Dr Ramandeep Singh Sidhu, are assessing whether these mulches improve soil physical, chemical and microbial properties their implications in terms of sustainable and productive apple growing systems.

The study also examines their effects on soil microorganisms, carbon sequestration, and nutrient cycling, as well as their potential to enhance fruit quality and yield.

Early results suggest that if living mulches are left to become over-grown in tree lines they may compete with trees for resources. Compost, straw and mow/throw mulches show promise for improving vegetative growth and fruit yield.

The second season of this trial is continuing in 2025 and further to generate further insights.

Learn more:

▾ Dr Ramandeep Singh Sidhu.

Livestock Production Centre

Livestock Production Centre

We aim to enhance the productivity and profitability of Tasmania's livestock supply chains while achieving positive social and environmental outcomes.

Our focus areas include:

- Promoting the sustainable use of inputs, including water and nitrogen, through innovative management practices.
- Developing and testing resilient plant varieties and diverse pastures to support rain-fed pasture systems in a changing climate.
- Adapting the grass-fed system to meet evolving societal expectations while ensuring animal welfare and human wellbeing.
- Mitigating greenhouse gas emissions through novel feed additives and forage innovations.
- Delivering extension, development and education programs to strengthen Tasmania's livestock industry.

We also operate the TIA Dairy Research Facility at Elliott in North-West Tasmania, which underwent a muti-million-dollar transformation in 2022, in a project jointly funded by the University of Tasmania and the Tasmanian Government. This is the site of world-leading research into ways to boost the productivity, profitability and sustainability of Tasmania's dairy industry.

▾ The Super Smart Feeder and GreenFeed support TIA's research into reducing livestock emissions.

Low-emissions feed solutions for livestock

Project: **On-farm adoption of low emissions feed technologies for improved profitability of the Tasmanian livestock sector)**

Funding body: Department of Natural Resources and Environment Tasmania, via the Agricultural Development Fund

Industry partners: Sea Forest

Research team: Associate Professor Richard Rawnsley, Dr Apeh Omede, Rohan Borojevic.

TIA is committed to helping to reduce methane emissions from livestock. We have a cross-sector research program underway to better understand the pathway to adoption for low emissions feed additives in Tasmania.

One of the key projects within the program is assessing delivery mechanisms for feeding the Tasmanian grown native seaweed, Asparagopsis, to animals in extensive grazing systems. Outcomes from this research will help industry remain at the forefront of sustainable and practical solutions to reduce greenhouse gas emissions.

Asparagopsis has shown to be effective in reducing emissions from livestock. The focus of this work is identifying how the additive can be best used in Tasmania's grazing-based systems.

Through a series of controlled research studies, we are evaluating varying delivery systems and formulations. Importantly, our work is focussed on ensuring a positive impact on animal health and production in balance with environmental benefits.

This is a rapidly developing area involving many stakeholders across the agricultural, government and private sectors. Focus in this area is expected to continue to increase as we move towards 2050 and key reduction targets, such as the Australian Government's target to transition to a net zero economy along with specific industry targets.

We are focused on ensuring that the research integrates into Tasmanian production systems by partnering with farmers and adapting to suit Tasmanian agricultural systems. This program aims to set up the Tasmanian livestock sector for future success and long-term sustainability.

Learn more:

Reducing synthetic nitrogen on dairy farms

Project: **Dairy HIGH 2 (high integrity grass-fed herds)**

Funding body: Dairy Australia and the Tasmanian Institute of Agriculture

Research team: Dr James Hills, Pieter Raedts, Dr Megan Verdon, Ben Noble, Associate Professor Richard Rawnsley, Lesley Irvine, Andrew Marshall, Dr Zac Beechy-Gradwell

Launched in 2020, the long-term research partnership between TIA and Dairy Australia is driving innovation in feedbase management to support efficient, profitable and sustainable pasture-based dairy systems. This collaboration builds on a decade of success, following the initial partnership established in 2012.

The current program sets an ambitious target to help dairy farmers reduce their reliance on synthetic nitrogen fertiliser by 50 per cent while maintaining the same levels of pasture productivity and milk solid yields per hectare.

Enhancing nitrogen use efficiency will lower a key input cost for dairy farmers and strengthen the industry's environmental sustainability.

To achieve this, a farmlet-style trial was established at TIA's Dairy Research Facility to assess the effect of different pasture compositions and nitrogen application rates under real farm conditions with four separate herds.

The application rates range from zero synthetic nitrogen up to the industry standard 300 kg per hectare, and the trial will be replicated over three seasons.

Farmlets one and two have a target pasture mix of 80 per cent perennial ryegrass and 20 per cent white clover. Farmlet three has a target of 40 per cent perennial ryegrass, 30 per cent white clover, and 30 per cent plantain. Farmlet four has a target of 40 per cent mixed grasses, 30 per cent mixed legumes (clover), and 30 per cent mixed herbs (predominantly plantain).

"Preliminary results indicate that it is possible to meet high targets for pasture and milk solid production while applying less nitrogen and utilising mixed pasture species including clover," Research Fellow, Pieter Raedts said.

As the only site in Australia conducting this type of large-scale, irrigated pasture study with grazing dairy cows, this project positions Tasmania at the forefront of contemporary dairy research and innovation, delivering nationally significant outcomes for the sector.

Stay informed: Each month we publish a detailed report featuring data and insights, alongside a field-based video update capturing the latest observations. Stakeholders can subscribe to receive these updates or access them anytime on the TIA website.

Learn more:

▾ Research Fellow Pieter Raedts.

Drought resilient pastures

Project: Pasture 365: Can more diverse pastures to build resilience to support 365 days of feed production

Funding body: Australian Government's Department of Agriculture, Water and Environment through the Future Drought Fund Long Term Trials Program

Industry partners: Deakin University (Lead), University of Melbourne, Agriculture Victoria, University of Western Australia, Department of Primary industries and Regional Development WA, Department of Primary Industries and Regions SA – South Australian Research and Development Institute, Bush Heritage Australia, and a range of producer groups

Research team: Dr Rowan Smith, Dr James Hills, Emily Hall and Joanna Talbot

TIA is a partner in the Pasture 365 project, led by Deakin University, that has a goal to identify forage mixes that could provide livestock with feed for all 365 days of the year.

Getting the right forage mix has the potential to increase productivity for the livestock sector by filling the summer feed gap when farmers often source feed off-farm, which is a significant cost to farming businesses.

Nine trial sites have been established across southern Australia in collaboration with farmers, including two in Tasmania at Campbell Town and Pipers River.

Dr Rowan Smith is the Tasmanian project lead. He said the trial sites are focussed on experimenting with different combinations of pasture mixes to identify combinations that are more resilient to extended and more regular periods of dry times.

"In the Pipers River area, its common to sow perennial ryegrass and white clover so we're using that as a benchmark. We've sown 12 different treatments alternating the amount of herbs, legumes and grasses species with the most complex treatments containing up to 10 to 12 different species," Dr Smith said.

"We're looking at those complex mixes and whether they complement or start to restrict the most productive pasture species. The aim is to successfully incorporate a diverse range of pasture species including grasses, legumes and herbs to boost productivity during dry times."

The five-year series of experiments and demonstrations will evaluate both simple and complex pasture mixes and assess productivity.

Learn more:

Unlocking the potential of grazing systems with virtual fencing

Project: **Virtual fencing: A game changer for pasture-based livestock systems**

Funding body: Department of Natural Resources and Environment Tasmania, through the Agricultural Development Fund

Industry partners: Halter, Tasmanian dairy businesses

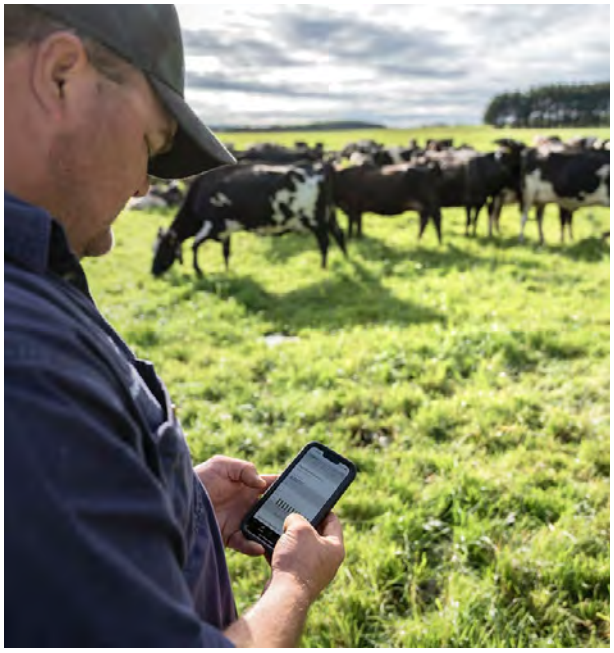
Research team: Dr Megan Verdon, Professor Richard Rawnsley, Oliver Radford

There are hopes that virtual fencing technology, which is increasingly being adopted on Tasmanian dairy farms, could be used to optimise pasture consumption and boost milk production by developing novel grazing regimes that support the natural behaviours of livestock.

Dr Megan Verdon is collaborating with Tasmanian dairy farmers that are early adopters of virtual fencing technology to learn from their experience and share insights with others that are interested in using the technology in the future.

"The research is guided by dairy farmers who are sharing their on-the-ground experience using the technology and what they see as possible future uses," Dr Verdon said.

▾ Halter virtual fencing in action. Photo supplied by Halter.



▴ Dr Megan Verdon, TIA Research Fellow.

> "A top priority that farmers identified as a future use for virtual fencing technology is around new and novel ways to optimise grazing. Farmers are interested in opportunities to increase the amount of pasture that cows are consuming to support increased milk production – and doing this in a way that maintains or improves animal welfare."
> Dr Verdon said.

A five-week grazing trial was conducted at the TIA Dairy Research Facility involving 160 dairy cows during 2024. The trial was designed to align pasture availability to the natural grazing behaviours of cattle facilitated by virtual fencing technology.

"Dairy cows have natural behavioural fluctuations and like to have their main feed in the evening, a little top-up at night, a small meal at dawn, and then snack during the day," Dr Verdon said.

Preliminary data indicates that the optimised grazing regime significantly reduced the time that cows spent in SARA and acidosis. Further data around pasture utilisation, cow health, cow behaviour, and milk production will be analysed in 2025.

Learn more:

Dairy calf enrichment trial

Project: **Effective enrichment in dairy calf (honours project)**

Research team: Rhiannon Cox, University of Tasmania Bachelor of Agricultural Science with Honours student. Rhiannon was supervised by Dr Megan Verdon, Dr Peta Taylor, and Dr Sarah Andrewartha

Rhiannon Cox conducted a six-week animal enrichment trial at TIA's Dairy Research Facility at Elliott as part of her honours research project. During 2024, she studied the final year of a Bachelor of Agricultural Science with Honours at the University of Tasmania, which is delivered by TIA.

Previous research indicates the environment in a calf shed has a significant ongoing impact on the welfare of dairy cows. Rhiannon's study aimed to identify practical things that farmers can easily implement on their farm with minimal financial outlay.

> **"My research project is looking at the role of enrichments, or toys, in the calf shed. I'm studying what type of enrichment activities the calves appear interested in and choose to interact with. I'm also looking at the connection with reduced stress levels and increased weight gain which are important indicators for calves,"** Rhiannon said.

She said enrichment activities that allow animals to display biologically relevant behaviours (e.g. suckling) appear to be more beneficial than objects that don't serve any real purpose such as a bouncy ball.

"Calves will often suckle on fixtures in the calf pen, bedding or other animals and this can lead to health problems. The introduction of enrichment activities can safely redirect behaviour and will hopefully lead to animals that are less stressed and more productive later in life," Rhiannon said.

Learn more:

▸ Honours student Rhiannon Cox conducted a calf enrichment trial at the TIA Dairy Research Facility.

Learning and Teaching

Learning and Teaching

About the teaching program

Agricultural science courses at the University of Tasmania are shaped by the expertise of the Tasmanian Institute of Agriculture (TIA), providing a globally relevant education that integrates food systems concepts and ideas from around the world.

Our flagship Bachelor of Agricultural Science with Honours degree offers hands-on, practical learning at both the Hobart and Launceston campuses. This program equips students with industry-ready skills and prepares them for careers in diverse fields including farming, agronomy, government advisory roles, agribusiness, finance, technology development, and food safety.

TIA also offers the Masters of Agriculture and Food Sciences which delivers advanced, contemporary knowledge in agriculture and food sciences to help graduates excel in research, innovation and leadership roles within industry.

Agricultural Science Careers Forum

TIA hosted an Agricultural Science Careers Forum in August 2024, providing students with a valuable opportunity to connect with industry professionals and explore the diverse career pathways available in the agriculture sector.

The event facilitated meaningful conversations between students and industry representatives, offering insights into the wide range of careers within agriculture. It also served as a platform for businesses to engage with future graduates and discuss the skills and expertise needed in the evolving agricultural landscape.

“It’s incredibly beneficial for students who are considering their future career paths. Many are surprised by the variety of opportunities that are available in the agriculture sector,” Professor Alistair Gracie said.

Alumnus Oliver Gales now works for the Federal Government in the Department of Climate Change as a climate negotiator. He was a panellist at the forum and emphasised the wide range of career options for agricultural science graduates.

“My advice to anyone studying ag science is to dream and to dream big because I really think the amount of opportunities out there are limitless. Whether you want to stay in Tassie in the agricultural industry or want to head overseas and work in the multi-lateral UN system there are opportunities for everyone,” Mr Gales said.

▾ Agricultural science graduate Oliver Gales at the Ag Science Careers Forum.

▾ Agricultural Science Careers Forum.

Scholarships empowering agricultural science students

Each year, more than $250,000 in scholarships is available to agricultural science students at the University of Tasmania. These scholarships play a vital role by easing financial pressures and enabling students to focus on their studies.

We are deeply grateful for the generosity of donors, whose contributions make it possible to offer a diverse range of scholarships each year. Their support not only alleviates financial pressure but also inspires excellence and encourages future leaders in the field of agricultural science.

In 2024, second-year student Bronte Legro was awarded the Neale Edwards Scholarship in Agricultural Science or Forestry, a merit-based scholarship which recognises outstanding academic achievement.

“Receiving the Neale Edwards Scholarship has further fuelled my determination to excel in my studies and pursue my aspirations. It serves as a testament to my commitment to the agricultural sector and provides invaluable support as I work towards achieving my goals. With this scholarship, I am eager to continue learning, growing, and ultimately, making a difference in the agricultural community,” Bronte said.

▾ Bronte Legro was awarded the Neale Edwards Scholarship in Agricultural Science or Forestry.

▴ Masters graduates Fatimah Umatiya and Pratima Karki.

A world of opportunity for food science graduates

The Master of Agriculture and Food Science provides an opportunity for students to develop specialised skills and knowledge, paving the way for a higher research degree or a career in agriculture and food related industries. Delivered by the Tasmanian Institute of Agriculture (TIA), the course is an immersive experience that provides practical learning through laboratory work, field trips, and work placements with agricultural enterprises.

Fatimah Umatiya, originally of India, and Pratima Karki, originally of Nepal, were among the first cohort to graduate from the Master of Agriculture and Food Science in 2024.

“I studied at bachelor of chemistry in Mumbai and always wanted to do something that relates to food safety and food science, and I wanted to study abroad,” Mrs Umatiya said.

“The course offered by the University of Tasmania suited what I was looking for. The experience has been great, and the supervisors have been extremely supportive and encouraging.”

Looking to the future, Mrs Umatiya is eager to put skills into practice in an industry setting where she hopes to further develop her understanding of the challenges facing industry.

“You know what the challenges are by reading academic papers, but it is so beneficial to go out there into industry and experience it,” she said.

As part of the course, Miss Karki undertook an independent research project focussed on plant physiology of pyrethrum. She worked in collaboration with Botanical Resources Australia, who are a global leader in the production of pyrethrum.

“I was able to link with farmers and I went in the field to check crops and take samples. It’s been an exposure to a whole new world getting out of the lab and into the field,” she said.

“Looking forward, I would like to work in research and possibly complete a PhD in the future. In the meanwhile, I would like an industry job to harness more knowledge.”

Learn more:

▴Agricultural science students visiting Fonterra as part of a three-day camp visiting north-west agricultural businesses.

Hands-on learning and industry connections

The Bachelor of Agricultural Science is highly practical degree that immerses students in Tasmania's dynamic agricultural sector, providing them with hands-on experiences and opportunities to connect with industry professionals.

In 2024, first-year students participated in a three-day tour of agricultural businesses in Tasmania's north-west, gaining firsthand insight into various industries. They participated in factory tours, explored farms, orchards, glasshouses and polytunnels. Students also engaged with leaders in the Tasmanian agricultural industry who offered valuable perspectives on career opportunities and innovations shaping Tasmania's agricultural future.

The camp is held annually to provide first year students an opportunity to develop a deeper understanding of the diverse career options available in agriculture.

"The students get a rare chance to see the inner workings of many Tasmanian agricultural enterprises. They can hear directly from people working in the agricultural industry and see firsthand the amazing innovation that is happening in the sector," TIA lecturer Dr Nathan Tivendale said.

The camp is part of TIA's commitment to equipping students with the knowledge, connections and inspiration to forge successful careers in agriculture.

▸ Field trip for first year agricultural science students.

2024 TIA Research Projects

Funding body	Industry partners	Research team	Title of project
AgriFutures	Beanstalk Agtech Pty Ltd	Sandra Knowles (TIA - Research Institute); Grant Gilmour (External); Caleb Connor (External)	AgriFutures Tasmanian Agriculture Digital Literacy Project
Australian Centre for International Agricultural Research	Department of Primary Industries NSW,Vietnamese Academy of Forest Sciences, Centre for Forest Biotechnology and Tree Improvement, Forestry research and Deleopment Agency, Centre for Climate Risk and Opportunity Management in Southeast Asia and Pacific	Caroline Mohammed (TIA - Research Institute); Morag Glen (TIA - Research Institute); Rebecca Harris (Geography, Planning and Spatial Sciences); Darren Turner (Geography, Planning and Spatial Sciences); Russell Warman (TIA - Research Institute)	Managing Risk in South East Asian Forest Biosecurity
Australian Centre for International Agricultural Research		Russell Warman (TIA - Research Institute); Simon Lawson (External); Madaline Healey (External); Richard Hayes (External); Harriot Beazley (External)	Building effective forest health and biosecurity networks in SE Asia
Australian Research Council		Neena Mitter (External); Katherine Evans (TIA - Research Institute)	BioClay Sustainable Crop Protection
Australian Research Council		Julia Blanchard (Ecology and Biodiversity); Duncan Cameron (Ecology and Biodiversity); Benjamin Halpern (External); Chris Carter (Sustainable Marine Research Collaboration); Catriona MacLeod (Sustainable Marine Research Collaboration); Louise Adams (Fisheries and Aquaculture); Peat Leith (TIA - Research Institute); John Bowman (Agriculture and Food Systems); Karen Alexander (Sustainable Marine Research Collaboration); Beth Penrose (TIA - Research Institute)	Optimising feeds to support ecosystem-based aquaculture
Australian Research Council	Australian Research Council	Jeffrey Walker (External); Brian Ng (External); James Hills (TIA - Research Institute)	Towards an Active and Passive L- and P-band soil moisture satellite mission
Australian Research Council	Syrinx Environmental Pty Ltd, INTEGRATED VALUE ECOSYSTEM ECONOMIES PTY LTD	Michael Breadmore (Chemistry); Shane Powell (Agriculture and Food Systems); Marni Amuno (Chemistry); Ljiljana Pantelic (External)	Automated Sensors for a wetland in a box
Australian Research Council		Sergey Shabala (TIA - Research Institute); Meixue Zhou (TIA - Research Institute); Lana Shabala (TIA - Research Institute); Zhong-Hua Chen (External); Guoping Zhang (External); Jihua Tang (External); Zhongyang Huo (External); Fanrong Zeng (External); David Leah (External)	Reducing environmental footprint by improving phosphorous use efficiency
Australian Research Council		Jeffrey Walker (External); James Hills (TIA - Research Institute)	Smart Irrigation: integrating UAV soil moisture maps & variable rate sprays
Australian Research Council	Botanical Resources Australia - Agricultural Services Pty Ltd	Tamieka Pearce (TIA - Research Institute)	Pyrethrum in half the time: genes and systems to annually crop a perennial
Australian Research Council		Holger Meinke	Industry Fellowships Program Selection Advisory Committee (IFPSAC) 2023 - 2024
Australian Wool Innovation Limited		Matthew Harrison (TIA - Research Institute); Karen Christie-Whitehead (TIA - Research Institute)	BENEFITS: Biodiversity, Ecosystems, Net Emissions and Forestry ITemiSation of wool farms
Australian Wool Innovation Limited		Brian Horton (TIA - Research Institute)	Modelling management of sheep blowfly resistance to pesticides
Australian Wool Innovation Limited		Matthew Harrison (TIA - Research Institute); Albert Muleke (TIA - Research Institute)	DELIGHTED: DoEs biodiversity infLuence pasture productIon, GHG emissions or profiT?
AW Howard Memorial Trust		Apeh Omede (Agriculture and Food Systems); Richard Rawnsley (TIA - Research Institute)	Biochar-Bromoform interactions in the rumen
AW Howard Memorial Trust		Tory Clarke (TIA - Research Institute)	Rapid assessment of nutritional value and performance of pasture species in the field using chlorophyll fluorescence
Botanical Resources Australia Pty Ltd		Jason Scott (TIA - Research Institute); Tamieka Pearce (TIA - Research Institute)	Mechanisms and spread of fungicide resistance in pyrethrum fungal pathogens

Funding body	Industry partners	Research team	Title of project
Charles Sturt University		Adel Yousif (Agriculture and Food Systems); Christopher Blanchard (External); Daniel Waters (External)	Expanding options for Sorghum - 1
CRC for High Performance Soils Ltd		Morag Glen (TIA - Research Institute); Caroline Mohammed (TIA - Research Institute); Ross Corkrey (TIA - Research Institute)	Microbial changes associated with improved or reduced soil health
CRC for High Performance Soils Ltd		Marcus Hardie (TIA - Research Institute)	Next Generation Below Ground Sensor Communication using Seismic Waves for Smart Soil Applications
CRC for High Performance Soils Ltd		Shane Powell (Agriculture and Food Systems); Caroline Mohammed (TIA - Research Institute); Marcus Hardie (TIA - Research Institute); Philip Young (UTAS Holdings Pty Ltd); Nigel Swarts (TIA - Research Institute); Byeong Kang (Information and Communication Technology); Muhammad Shahinur Alam (TIA - Research Institute); Simon Edwards (TIA - Research Institute); Ian Hunt (TIA - Research Institute); Chris Boucher (TIA - Research Institute)	Smelling soil: eNose development (TIA led)
CRC for High Performance Soils Ltd		Marcus Hardie (TIA - Research Institute); Caroline Mohammed (TIA - Research Institute); Leonore Ryan (UTAS Holdings Pty Ltd); Stephen Cahoon (Maritime and Logistics Management); Richard Ballard (TIA - Research Institute); Simon Edwards (TIA - Research Institute); Matthew Singline (Sense-T)	Commercialising the 'Bilby' below ground wireless sensor node
CRC for High Performance Soils Ltd		Liang Wang (External); Fernando Maya Alejandro (Chemistry); Michael Breadmore (Chemistry); Richard Doyle (Agriculture and Food Systems); Ravi Naidu (External); Ashad Kabir (External); Rob Milla (External); Lawrence Di Bella (External)	Rapid field-based soil measurement approach using an integrated smartphone system.
CRC for High Performance Soils Ltd	Southern Farming Systems Ltd, Birchip Cropping Group, Burdekin Productivity Services, Riverine Plains Incorporated	Marcus Hardie (TIA - Research Institute); Simon Edwards (TIA - Research Institute); Chris Boucher (TIA - Research Institute); Caroline Mohammed (TIA - Research Institute); Leonore Ryan (UTAS Holdings Pty Ltd); Muhammad Shahinur Alam (TIA - Research Institute)	Commercialising the Penetrometer (Bandicoot)
CRC for High Performance Soils Ltd		Marcus Hardie (TIA - Research Institute); Caroline Mohammed (TIA - Research Institute); Simon Edwards (TIA - Research Institute); Richard Bell (Murdoch University); Terry Rose (Southern Cross University); Murray Hart (Central West Farming Systems Inc.)	Evaluating novel approaches for drought resilience through capitalising on an established network of long-term trials.
Dairy Australia Limited		James Hills (TIA - Research Institute); Adam Langworthy (TIA - Research Institute); Peter Raedts (TIA - Research Institute); Carlton Gee (TIA - Research Institute); David McLaren (TIA - Research Institute); Megan Verdon (TIA - Research Institute); Thomas Snare (TIA - Research Institute); Bradley Millhouse (TIA - Research Institute)	Dairy High 2
Dairy Australia Limited		Adam Langworthy (TIA - Research Institute); James Hills (TIA - Research Institute)	Soil Function in Varied Pasture Systems
Dairy Australia Limited		Lesley Irvine (TIA - Research Institute); Symon Jones (TIA - Research Institute); Rohan Borojevic (TIA - Research Institute)	Dairy Farm Monitor Project Tasmania 2023
Deakin University		Rowan Smith (TIA - Research Institute); Cindy Cassidy (External); James Hills (TIA - Research Institute)	Feed 365: Can more diverse pastures to build resilience to support 365 days of feed production
Department of Agriculture		Laura Rood (TIA - Research Institute)	The effects of pH on the shelf-life of vacuum-packed pork products

Funding body	Industry partners	Research team	Title of project
Department of Agriculture Water and the Environment	Private Forests Tasmania, The Northern Tasmanian Natural Resource Management Assoc Inc., Cradle Coast Authority, Southern Cross University, Tasmanian Land Conservancy, Rural Alive and Well Inc., Regenerative Agriculture Network Tasmania, Enviro-Dynamics Pty Ltd, Rural Business Tasmania Inc, Beanstalk Agtech Pty Ltd, The Derwent Catchment Project Inc, East Coast Primary Producers Association, Ag Logic Pty Ltd, Pinion Advisory, Flinders Aboriginal Resource Management Pty Ltd, HEAL COUNTRY PTY LTD, Landcare Tasmania	Sandra Knowles (TIA - Research Institute); Caroline Mohammed (TIA - Research Institute); Saideepa Kumar (TIA - Research Institute); Brian Field (TIA - Research Institute); Menna Jones (Biological Sciences); Robert Anders (Geography, Planning and Spatial Sciences); Vaughan Higgins (Office of the School of Social Sciences); Melanie Bryant (College Office - CoBE); Matthew Harrison (TIA - Research Institute); Alistair Gracie (Agriculture and Food Systems); Matthew Wilson (Agriculture and Food Systems); Greg Jordan (Biological Sciences); Julianne O'Reilly-Wapstra (College Office - CoSE); Leon Barmuta (Biological Sciences); Byeong Kang (Information and Communication Technology); Muhammad Bilal Amin (Information and Communication Technology); Ananda Maiti (Information and Communication Technology); Sharon Fraser (Education); Sue Kilpatrick (TIA - Research Institute); Nicoli Barnes (TIA - Research Institute); Kim Beasy (Education); Bianca Coleman (Education); Natalie Stoeckl (College Office - CoBE); Jing Tian (Economics); Swee-Hoon Chuah (Economics); Kimberley Norris (Psychology); Stuart Ferguson (Medicine); Stuart Auckland (Health Sciences); Katherine Evans (TIA - Research Institute)	Drought Resilience Tasmania - Actionable Knowledge and Solutions for Sustainable Prosperity
Department of Agriculture Water and the Environment		Sandra Knowles (TIA - Research Institute); Caroline Mohammed (TIA - Research Institute); Liana Williams (TIA - Research Institute); Katherine Evans (TIA - Research Institute)	The Building Landcare Community and Capacity program - Innovation Hub Regional Soils Coordinator
Department of Agriculture Water and the Environment	Hydro Electric Corporation, Tasmanian Irrigation, Horticulture Innovation Australia, Southern Regional Natural Resource Management Association Inc, Derwent Catchment Natural Resource Management (NRM) Committee Inc, Southern Cross University, Cradle Coast NRM, Bush Heritage Australia, Definium Technologies Pty Ltd, Highland Conservation Pty Ltd, Cape Herbert Pty. Ltd., Tasmanian Women in Agriculture Inc, Rural Business Tasmania Inc, Beanstalk Agtech Pty Ltd, Biosecurity Tasmania, Optimum Standard (Aus) Pty Ltd	Sandra Knowles (TIA - Research Institute); Caroline Mohammed (TIA - Research Institute); Saideepa Kumar (TIA - Research Institute); Brian Field (TIA - Research Institute); Menna Jones (Biological Sciences); Robert Anders (Geography, Planning and Spatial Sciences); Vaughan Higgins (Office of the School of Social Sciences); Melanie Bryant (College Office - CoBE); Alistair Gracie (Agriculture and Food Systems); Matthew Wilson (Agriculture and Food Systems); Matthew Harrison (TIA - Research Institute); Greg Jordan (Biological Sciences); Julianne O'Reilly-Wapstra (College Office - CoSE); Leon Barmuta (Biological Sciences); Tom Remenyi (Geography, Planning and Spatial Sciences); Byeong Kang (Information and Communication Technology); Muhammad Bilal Amin (Information and Communication Technology); Sharon Fraser (Education); Sue Kilpatrick (TIA - Research Institute); Nicoli Barnes (TIA - Research Institute); Kim Beasy (Education); Natalie Stoeckl (College Office - CoBE); Steven D'Alessandro (Marketing); Jing Tian (Economics); Swee-Hoon Chuah (Economics); Kimberley Norris (Psychology); Stuart Ferguson (Medicine); Stuart Auckland (Health Sciences); Katherine Evans (TIA - Research Institute)	Agricultural Innovation Hubs Program
Department of Agriculture Water and the Environment		Saideepa Kumar (TIA - Research Institute); Caroline Mohammed (TIA - Research Institute)	Nurturing Agri-business learning and extension (eNABLE program) - consortium led by Rural Business Tasmania
Department of Agriculture Water and the Environment		Todd Nation (External); Matthew Harrison (TIA - Research Institute); Brian Horton (TIA - Research Institute); Nicoli Barnes (TIA - Research Institute)	Drought decision-support using the Farming Forecaster in Tasmania
Department of Agriculture Water and the Environment		Jonathan Finch (Agriculture and Food Systems)	Maximising the dual benefits of key ecosystem services and drought resilience in strategic revegetation programmes

Funding body	Industry partners	Research team	Title of project
Department of Agriculture Water and the Environment		Muhammad Shahinur Alam (TIA - Research Institute); Simon Edwards (TIA - Research Institute); Chris Boucher (TIA - Research Institute); Sophie Folder (TIA - Research Institute); Sue Hinton (TIA - Research Institute)	Adoption of Digital Agriculture Technologies for Climate Resilience Through Enhancing Farmers Participation, collaboration, and Accumulation of Users Experience from I4.0 Sensor Platforms.
Department of Agriculture Water and the Environment		Cindy Cassidy (External); Matthew Harrison (TIA - Research Institute); Karen Christie-Whitehead (TIA - Research Institute); Caroline Mohammed (TIA - Research Institute); Ke Liu (TIA - Research Institute)	Towards landscape-level drought adaptation through multidisciplinary systems analysis: Charles Sturt University collaboration
Department of Agriculture Water and the Environment		Michael Tausz (External); Matthew Harrison (TIA - Research Institute); Karen Christie-Whitehead (TIA - Research Institute); Caroline Mohammed (TIA - Research Institute); Ke Liu (TIA - Research Institute)	Towards landscape-level drought adaptation through multidisciplinary systems analysis: University of Melbourne collaboration
Department of Agriculture, Fisheries and Forestry		Katherine Evans (TIA - Research Institute); David Page (TIA - Research Institute)	Tas Wine Sector Sustainable Growth and Climate Adaptation
Department of Agriculture, Fisheries and Forestry	Southern Regional Natural Resource Management Association Inc	Sandra Knowles (TIA - Research Institute); Liana Williams (TIA - Research Institute); Alex Russell (TIA - Research Institute); Caroline Mohammed (TIA - Research Institute)	Capacity Building: Regional Soil Coordinators
Department of Education, Skills and Employment	University of Queensland, Monash University, Norske-Skog (Australasia) Pty Ltd, Bern University of Applied Science, Washington State University, Forico Pty Ltd, 915 Labs, CLTP Panel Products Pty Ltd, Forager Food, Hermal Bio Energy International Pty Ltd, Pure Foods Tasmania trading as Daly Potato Company Pty Ltd	Julianne O'Reilly-Wapstra (College Office - CoSE); Roger Stanley (TIA - Research Institute); Gregory Nolan (Architecture and Design); Brett Paull (Chemistry); Jason Smith (Chemistry); Gholamreza Kefayati (Engineering); Ali Tolooiyan (Engineering); Jon Shanks (Engineering); Assaad Taoum (Engineering); Louise Wallis (Architecture and Design); Stuart Thickett (Chemistry); Alex Bissember (Chemistry); Fernando Maya Alejandro (Chemistry); John De Vries (TIA - Research Institute)	Boosting research capability to develop value-added products for the food and wood industries in regional areas.
Department of Industry, Innovation and Science		Richard Doyle (Agriculture and Food Systems); Caroline Mohammed (TIA - Research Institute); Marcus Hardie (TIA - Research Institute); Paul Neumeyer (Sense-T); Bill Cotching (External); Stephen Cahoon (Maritime and Logistics Management)	CRC for High Performance Soils
Department of Industry, Innovation and Science		Wei Zhang (External); Craig Johnson (Directorate); Catriona Hurd (Ecology and Biodiversity); Christopher Bolch (Ecology and Biodiversity); Catriona MacLeod (Sustainable Marine Research Collaboration); Barbara Nowak (Sustainable Marine Research Collaboration); Jeffrey Wright (Ecology and Biodiversity); Camille White (Sustainable Marine Research Collaboration); Brett Paull (Chemistry); Steven Smith (Biological Sciences); Stuart Thickett (Chemistry); Jason Smith (Chemistry); Lito Quirino (Chemistry); Nigel Swarts (TIA - Research Institute); Toby Newstead (Management); Louise Grimmer (Marketing); Rachel Nichols (Economics); Rajesh Rajaguru (Marketing); Nuri Guven (Pharmacy); Karen Alexander (Sustainable Marine Research Collaboration)	Marine Bioproducts Cooperative Research Centre
Department of Industry, Innovation and Science		Tom Ross (TIA - Research Institute); Lyndal Mellefont (Agriculture and Food Systems); Grant Swanepoel (External); Jay Kocharunchitt (Agriculture and Food Systems)	Development of complementary preservatives for Australian meat products
Department of Industry, Science, Energy and Resources	FarmLab Pty Ltd	Matthew Harrison (TIA - Research Institute); Ke Liu (TIA - Research Institute)	Advanced machine cognition to segregate effects of climate from management at the landscape scale
Department of Natural Resources and Environment Tasmania		Michael Rose (TIA - Research Institute)	Research & Development Contractual Agreement - TIA JVA

Funding body	Industry partners	Research team	Title of project
Department of Natural Resources and Environment Tasmania		Richard Rawnsley (TIA - Research Institute); Matthew Harrison (TIA - Research Institute); John Bowman (Agriculture and Food Systems); Ian Hunt (TIA - Research Institute); Apeh Omede (Agriculture and Food Systems); Peter Raedts (TIA - Research Institute)	On-farm adoption of low emissions feed technologies for improved profitability of the Tasmanian livestock sector
Department of Natural Resources and Environment Tasmania	Simplot Australia	Calum Wilson (TIA - Research Institute); Jason Scott (TIA - Research Institute); Alistair Gracie (Agriculture and Food Systems); Audrey Leo (External)	Development of a decision support systems for management of potato diseases and estimating impact of changing climates
Department of Natural Resources and Environment Tasmania		Kara Barry (Agriculture and Food Systems); Brian Horton (TIA - Research Institute); Jason Scott (TIA - Research Institute); Michele Buntain (TIA - Research Institute); Tamieka Pearce (TIA - Research Institute); Katherine Evans (TIA - Research Institute)	New On-farm Strategies for the Prevention and Control of Blueberry rust in Tasmania
Department of Natural Resources and Environment Tasmania		Samantha Sawyer (Agriculture and Food Systems); Dugald Close (TIA - Research Institute); Nigel Swarts (TIA - Research Institute)	Beating smoke taint with sparkling wine : Climate Change Adaptation for the Tasmanian wine industry
Department of Natural Resources and Environment Tasmania		Saideepa Kumar (TIA - Research Institute); Sue Kilpatrick (TIA - Research Institute); Nicoli Barnes (TIA - Research Institute); Liana Williams (TIA - Research Institute)	Research-based monitoring, evaluation and learning to support the Farm Business Resilience Program in Tasmania
Department of Natural Resources and Environment Tasmania	Wine Industry of Tasmania, NUFARM AUSTRALIA LIMITED	Katherine Evans (TIA - Research Institute); Vaughan Higgins (Office of the School of Social Sciences); Nicoli Barnes (TIA - Research Institute); Michele Buntain (TIA - Research Institute)	Fast-tracking solutions for reliable and climate-responsive wine grape production.
Department of Natural Resources and Environment Tasmania	SunPharma Australia, Extracas Bioscience	Jason Scott (TIA - Research Institute); Tamieka Pearce (TIA - Research Institute); Pattie Weichelt (TIA - Research Institute)	Control of weed poppies in commercial poppy production
Department of Natural Resources and Environment Tasmania	Botanical Resources Australia Pty Ltd	Tamieka Pearce (TIA - Research Institute); Jason Scott (TIA - Research Institute); Stacey Pilkington (TIA - Research Institute)	Rapid Detection Systems for Pyrethrum Pathogens
Department of Natural Resources and Environment Tasmania	Halter New Zealand	Megan Verdon (TIA - Research Institute); Richard Rawnsley (TIA - Research Institute); Ian Hunt (TIA - Research Institute)	Virtual fencing: A game changer for pasture-based livestock systems
Department of Natural Resources and Environment Tasmania		Caroline Mohammed (TIA - Research Institute); Shane Powell (Agriculture and Food Systems); Chris Boucher (TIA - Research Institute); Muhammad Shahinur Alam (TIA - Research Institute); Simon Edwards (TIA - Research Institute); Marcus Hardie (TIA - Research Institute); Philip Young (UTAS Holdings Pty Ltd); Charissa Bensted (UTAS Holdings Pty Ltd)	Microbes against climate change: A low cost electronic nose to support soil health and resilience via soil carbon sequestration
Department of Natural Resources and Environment Tasmania		Brian Field (TIA - Research Institute); Matthew Harrison (TIA - Research Institute)	TIA GM Canola Management Support
Department of Natural Resources and Environment Tasmania		Nigel Swarts (TIA - Research Institute); Caroline Mohammed (TIA - Research Institute); James Hills (TIA - Research Institute); Marcus Hardie (TIA - Research Institute); Stephen Ives (Agriculture and Food Systems); Dan Daugaard (Finance); Richard Mawulawoe Ahadzie (Finance); Liana Williams (TIA - Research Institute)	Growing value from irrigation for Tasmanian agriculture
Department of Natural Resources and Environment Tasmania	Wine Tasmania	Harriet Walker	Tasmanian Wine Cool Climate research program
Fisheries Research & Development Corporation	Reid Fruits, DPIPWE - Abalone Industry Reinvestment Fund, Ralph's Tasmanian Seafood Pty Ltd	Nigel Swarts (TIA - Research Institute); John Keane (Sustainable Marine Research Collaboration)	FRDC Sea Urchin Fertiliser Project

Funding body	Industry partners	Research team	Title of project
Foundation for Rural and Regional Renewal		Caroline Mohammed (TIA - Research Institute)	Helping Regional Communities Prepare for Drought Community Impact Program
Grains Research & Development Corporation		Meixue Zhou (TIA - Research Institute); Chenchen Zhao (TIA - Research Institute); Peter Johnson (Facilities Management)	Increasing intrinsic heat tolerance of wheat through improved genetics in the source-sink relationship
Grains Research & Development Corporation	Iowa State University, USA	Meixue Zhou (TIA - Research Institute); Matthew Harrison (TIA - Research Institute); Ke Liu (TIA - Research Institute); Chenchen Zhao (TIA - Research Institute); Peter Johnson (TIA - Research Institute)	Understanding the impacts of waterlogging on barley, canola and fababean
Grains Research & Development Corporation		Tara Garrard (South Australian Research and Development Institute); Hari Dadu (Agriculture Victoria); Lisle Snyman (Department of Agriculture and Fisheries (QLD)); Xuechen Zhang (Department of Agriculture and Fisheries (QLD)); Judy McIlroy (Department of Agriculture and Fisheries (QLD)); Ben Ovenden (NSW Department of Primary Industry); Merrin Spackman (NSW Department of Primary Industry); Sanjiv Gupta (Murdoch University); Meixue Zhou (TIA - Research Institute); Peter Johnson (TIA - Research Institute); Anke Martin (University of Southern Queensland); Noel Knight (University of Southern Queensland); Buddhika Dahanayaka (University of Southern Queensland)	Monitoring and screening: Monitoring of Net Blotch populations for new virulences of industry significance
Halter New Zealand		Megan Verdon (TIA - Research Institute); Richard Rawnsley (TIA - Research Institute)	Welfare and productivity of dairy cows when managed with Halter technology
Horticulture Innovation Australia	Botanical Resources Australia Pty Ltd, Simplot Australia, Bejo Seeds Pty Ltd, Fruit Growers Tasmania Inc, Reid Fruits, Hansen Orchards, Seed Purity, Potatoes New Zealand, Premium Fresh, Scottish Society for Crop Research	Nigel Swarts (TIA - Research Institute); Dugald Close (TIA - Research Institute); Jason Scott (TIA - Research Institute); Calum Wilson (TIA - Research Institute); Alistair Gracie (Agriculture and Food Systems); Michele Buntain (TIA - Research Institute)	Sustainably growing horticulture value in cool climate Australia
Horticulture Innovation Australia		Warwick Gill (TIA - Research Institute); Dugald Close (TIA - Research Institute)	MU21007 Pest and disease management for the Australian mushroom industry
Horticulture Innovation Australia		Jonathan Finch (Agriculture and Food Systems); Stephen Quarrell (TIA - Research Institute)	Using pheromones and traps in the management of mirids and vegetable bugs
Horticulture Innovation Australia	Department of Economic Development, Jobs, Transport and Resources, NSW Department of Planning and Environment	Jonathan Finch (Agriculture and Food Systems); Stephen Quarrell (TIA - Research Institute); Michele Buntain (TIA - Research Institute); Ian Hunt (TIA - Research Institute)	Integrated pest management approaches to address pest challenges in raspberry and blackberry
Horticulture Innovation Australia	Department of Primary Industries NSW, Department of Primary Industries and Regional Development, Western Australia, Fruit Help Pty Ltd, Department of Energy, Environment and Climate Action	Nigel Swarts (TIA - Research Institute); Sally Bound (TIA - Research Institute); Dugald Close (TIA - Research Institute); David Page (TIA - Research Institute); Michele Buntain (TIA - Research Institute)	Optimising apple Production Systems through PIPS 4 Profits
Horticulture Innovation Australia	Department of Primary Industries NSW, PomeWest (Agricultural Produce Commission), Fruit Help Pty Ltd, Lenswood Cold Stores Cooperative Society Limited	Nigel Swarts (TIA - Research Institute); Sally Bound (TIA - Research Institute); Dugald Close (TIA - Research Institute); Morag Glen (TIA - Research Institute); Michele Buntain (TIA - Research Institute)	PIPS4 Profit: Sustainable Soils for the apple industry
Horticulture Innovation Australia		Ian Goodwin (External); Sally Bound (TIA - Research Institute)	AP22002 Pear production systems
Horticulture Innovation Australia		Greg Lefoe (External); Jonathan Finch (Agriculture and Food Systems); Stephen Quarrell (TIA - Research Institute); Ryan Warren (TIA - Research Institute); Ian Hunt (TIA - Research Institute)	AP22001 PIPS4 Profit - Pest and Disease Management
Horticulture Innovation Australia		Jonathan Finch (Agriculture and Food Systems)	Progress on bumble bees as commercial pollinators in Australia: update on risks and opportunities

Funding body	Industry partners	Research team	Title of project
Ian and Shirley Norman Foundation		Ryan Warren (TIA - Research Institute)	Innovative methods for the management of Varroa destructor in Australia
Marine Bioproducts CRC	Department of Natural Resources and Environment Tasmania	Harriet Walker (Sustainable Marine Research Collaboration); Nigel Swarts (TIA - Research Institute); John Keane (Sustainable Marine Research Collaboration); Ian Dutton (External)	Assessing the benefits of sea urchin processing waste as a soil ameliorant in commercial field trials
Martha Jane Medical		Professor Dugald Close	Confidential
Meat and Livestock Australia		Rowan Smith (TIA - Research Institute); Gary Martin (TIA - Research Institute); Peter Ball (TIA - Research Institute); Beth Penrose (TIA - Research Institute); Adam Langworthy (TIA - Research Institute)	Growing red meat productivity through the selection and establishment of perennial legumes
Meat and Livestock Australia		Jay Kocharunchitt (Agriculture and Food Systems); Tom Ross (TIA - Research Institute); John Bowman (Agriculture and Food Systems); Joanne Pagnon (Medicine)	Development of shelf life models for beef, lamb and pork
Meat and Livestock Australia		Jay Kocharunchitt (Agriculture and Food Systems); Tom Ross (TIA - Research Institute); John Bowman (Agriculture and Food Systems); Joanne Pagnon (Medicine); Lyndal Mellefont (Agriculture and Food Systems)	Application of glucose as a novel approach for shelf-life extension of vacuum-packed chilled sheep meats
Meat and Livestock Australia	Department of Primary Industries NSW, University of Melbourne, CSIRO-Commonwealth Scientific & Industrial Research Organisation, RM Consulting Group, The Mullion Group, Integrity Ag & Environment, South Coast Natural Resource Management	Matthew Harrison (TIA - Research Institute); Karen Christie-Whitehead (TIA - Research Institute); Mark Hovenden (Biological Sciences)	Sustainable pathways to CN30
Meat and Livestock Australia		Rebecca Haling (External); Rowan Smith (TIA - Research Institute); Beth Penrose (TIA - Research Institute); Gary Martin (TIA - Research Institute); Richard Hayes (External); Carol Harris (External); Cameron Murray (External); Richard Simpson (External); Adam Stefanski (External)	Serradellas for new environments
Meat and Livestock Australia		Jay Kocharunchitt (Agriculture and Food Systems); Laura Rood (TIA - Research Institute)	Evaluation of shelf-life of vacuum-packed beef in ethylene-vinyl alcohol film
Sea Forest		Richard Rawnsley (TIA - Research Institute); Peter Raedts (TIA - Research Institute); Apeh Omede (Agriculture and Food Systems)	Evaluating SeaFeed: On Farm assessment of intake and optimal dose rate in dairy cattle
South Australian Research and Development Institute	Wine Australia	Kara Barry (Agriculture and Food Systems); Mark Sosnowski (External)	Management and diagnosis of grapevine trunk disease in vineyards and nurseries
South Australian Research and Development Institute		Rowan Smith (TIA - Research Institute); Gary Martin (TIA - Research Institute)	Australian Pastures Genebank Germplasm Regeneration
Tasmanian Beef Industry (Research and Development) Trust		Richard Rawnsley (TIA - Research Institute); James Hills (TIA - Research Institute); Rohan Borojevic (TIA - Research Institute)	Advancing Productivity and Methane Assessment Technologies on Tasmanian Beef Farms
W & E Health Pty Ltd		Dugald Close (TIA - Research Institute); Alieta Eyles (TIA - Research Institute); Sandra Garland (TIA - Research Institute)	Research Hub for Traditional Chinese Herbs
Zero Net Emissions from Agriculture CRC	University of Queensland, Department of Natural Resources and Environment Tasmania	Michael Rose (TIA - Research Institute); Richard Rawnsley (TIA - Research Institute); Jason Scott (TIA - Research Institute)	Zero Net Emissions from Agriculture Cooperative Research Centre (ZNE-Ag CRC)

Higher Degree Research Projects

Student		Research title
Mertes	Eric Franz	The Effect of Pre-Harvest Tree Management on Fruit Quality and Phenolic Chemistry in Sweet Cherry During Post-Harvest Storage
Steel	Elya Yogita	Primary School Programs in Agricultural Extension for Rural Community Development
McCrory	Claire Maree	Extending the Shelf-life of Cherries
Block	Zachary John	Response of Escherichia coli to Temperature Stress Relevant to the Meat Cold Chain
Zou	Meilin	Investigation of Recombination and Segregation Distortion in Barley
Kerstan	Tony Andrew	The Green Drought - Pasture that survives but does not thrive under Centre Pivot Irrigation. An investigation of irrigation efficiency and effectiveness on Tasmanian dairy farm soils.
Goward	Laura Elizabeth	The Physiology of Flowering and Seed Production in Yellow Serradella (Ornithopus compressus L.) and French Serradella (Ornithopus sativus Brot.)
Kay	Phillip Martin	Microbial Changes Associated with Improved or Reduced Soil Health
French	Philippa Anne	Science to Inform Decision Making Between Synthetic and Alternative Nitrogen Sources in Vineyards
Lim	Meng Yong	The Impact of Fungicide Applications on Crop Pollination and Honey Bee Health
Dong	Yumo	The Economic Feasibility of Wide Span Controlled Traffic System in Vegetable Industry
Dilena	Enrico	Manipulating Environmental Factors for Targeted Cannabinoid Production
Zelelew	Demlie Gebresellassie	Quantifying the Economic and Ecosystem Services of Agriculture: a spatial-statistical approach based on regional soil water flux predictions
Ospina Rios	Sandra Liliana	Effect of Rearing Environment on Heifer Stress Resilience, Productivity and Welfare Around their 1st Calving
Chapman	Theresa	Diversity and Function in Cover Crops
Su	Zhouyang	Relationship between Fusarium Crown Rot Resistance and Drought Tolerance in Wheat and Barley
Niu	Yanan	Genetic Studies on Lodging Resistance of Cereal Crops
Law	Hui Meng	Optimising Root Growth and Secondary Metabolite Production through Cultivation of Astragalus mongholicus
Ogungbuyi	Michael Gbenga	Improving Real-time Pasture Management using Remote Sensing, Machine Learning and Big Data Analytics
Buziak	Dorota	Traditional Chinese Medicinal Herbs: Understanding quality through sensory and plant chemical analysis
Bondad	Jamina Gabrielle Javier	Development of an Integrated Disease-crop Lifecycle Model: Analysis of blackleg disease (Leptosphaeria maculans) in canola (Brassica napus)
Thakur	Shilpa	Increasing utilisation of non-replacement dairy calves in Australia
Toomik	Elerin	Understanding Potential Mechanisms of Red Meat Spoilage
Jiang	Chenting	Machine Learning the Soil Water Function
Jiang	Zheng	Ecophysiological Suitability of Polygonatum Odoratum to Tasmania: Novel horticultural growing systems
Guo	Ce	Identification of New Candidate Genes for Acid Soil Tolerance in Barley
Dai	Shilin	Adaptation and quality of Polygonatum sibiricum as a herb for Traditional Chinese Medicine
Bowen Butchart	Dominique	Pathways to a Carbon Neutral Livestock Industry by 2030
Targett	Peter James	Investigating plant disease mechanisms of infection of Carrot Crown Rot and Pea Collar Rot
Olivier	Sandra Angeline	Novel Microbes in Fermentations
Wunderlich	Georgia Clementine Rowntree	Useful microbes in equine guts
Nepal	Swagat	Investigating low emissions feed technologies for improved profitability of the Tasmanian livestock sector
Liu	Chongyue	Traditional Chinese Medicinal herbs as new crops: Growing systems and quality
Pham	Kieu My	Improving Environmental Sustainability of Beef Value Chains in Australia Through Carbon Accounting

Student		Research title
Frimpong	Justice Okona	Processing and analysing Enose data
Wu	Yufei	Traditional Chinese Medicinal herbs as new crops: Growing systems and quality
Benedetti Vallenari	Pia Francesca	Smart-Farm data for dairy cows
Siddique	Abu Bakar	Stomatal functions in crop tolerance to combined abiotic stresses
Ijaz	Usman	Cloning of a Scald Resistance Gene in Barley
Van Sprang	Celia	Chinese Medicinal Herbs as New Crops: Growing systems and quality
Taiwo	Akeem Owolabi	Managing Botrytis in Wine Grapes
Heng	Wan Sin	Rapid Bacteria Detection
Poosarla	Pooja Rajasri	Mechanisms and Spread of Fungicide Resistance in Pyrethrum Fungal Pathogens
Nishshanka Achchi Kankanamalage	Inosha Hansamali	Nitrogen Fertiliser use in the Tasmanian Dairy Industry: Managing N surpluses to support a more sustainable future
Chen	Jianbo	Alleviate Waterlogging Damage through Fertilization in Barley (Hordeum vulgare L)
Krauss	Laurie Louise	Weeds in Rotational Cropping
Khan	Fahad	Understanding and Manuipulating Protein Synthesis in Fava Beans to Produce High Protein Fava Beans for an Alternative Protein Future
Ahmed	Muhammad Zeshan	Barley yellow dwarf resistance in wheat
Thapa	Ronika	Pink Rot of Potato, a Reemerging Problem
Bhattarai	Ganesh	Commercial Carbon Accounting Case Study
Lohani	Shreeya	Water Accountability and Sustainability
Nguyen	Thi Thanh Hien	Diffuse to Confuse
Shahriar	Saleh Ahmed	Blueberry rust epidemiology
Ahmad	Ibrahim	Biochar-Bromoform interactions in rumen
Anand	Uttpal	G2E for Verticillium control
Hussain	Md Ashraf	Nitrogen transformation in Dairy Pasture
Ahmed	Jaher	Conservation Biological Control in Rubus
Zhao	Haochen	Canola waterlogging tolerance
Sharmita	Onusha	How do crops adapt to waterlogging
Ash	Rebekah	Aligning sustainable farm system interventions and policy under our future climate
Scofield	Claire	Cherry quality and protected cropping
Fearnley	Jessica Caroline	Carbon sequestered in apple production
Green	Izaac Benjamin	Drought Resilience in Tasmania – Comparison of farmers approaches and applications of drought resilience techniques and management plans
Rehman	Fazal Ur	Pathogen interactions – in the soil
Wagle	Pramila	Protected cropping for premium berries
Bhusal	Kiran	Determination of sucking bug population thresholds in Australian Rubus
Yangchen	Jamyang	
Mallam	Gypsy Jade Bell	Microbial Degradation of Plastic Waste
Akram	Hina	Modelling Soil-borne Disease of Potato
Van Kints	Seeger Kay	Management of sucking bugs in Rubus
Azeem	Muhammad Atif	QTL for wheat septoria resistance
Ahamed	Zubayed	Enhancement of flavor in shelf- stable ready meal through natural antioxidant strategies
Kinred	Emmaline Kirsty	Microbes and Carbon Exploring the relationships between microbial community functions, soil health and land management
Aawulenaa	Rose Pagr-tuur	Barriers for indigenous engagement
Bhattarai	Shiva Shankar	Efficacy of conservation biological control against codling moth in apple orchards

2024 TIA Publications

Abdallh, M., Chang'a, E., Omede, A., Ahiwe, E., Al-Qahtani, M., Cadogan, D., & Iji, P. (2024). Endogenous enzyme activities, digestibility of nutrients and digestive physiology as affected by high inclusion of cottonseed meal in broiler chicken diets. *European Journal of Agriculture and Food Sciences*. https://doi.org/10.24018/ejfood.2024.6.1.752

Ahmad, I., Omede, A., & Rawnsley, R. (2024). Harnessing a long transition period in feeding Asparagopsis for enteric methane mitigation in ruminants. *Proceedings of the 35th Biennial Conference of the Australian Association of Animal Sciences*.

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Financial Report

TASMANIAN INSTITUTE OF AGRICULTURE (TIA)

NOTES TO ACCOMPANY FINANCIAL DETAILS

The financial details reported here relate to TIA activities for 2024. The detail was prepared by TIA and checked by Financial Services, University of Tasmania.

Specific contributions from each funding source are as follows: -

1.	**University of Tasmania**	
	2024 Operating Grant Funds to TIA/School of Agricultural Science	$5,594,557
	2024 University Research Scholarships to PhD students studying in areas related to TIA activities	$1,448,116
	TOTAL University of Tasmania contribution	**$7,042,673**
2.	**Department of Natural Resources & Environment Tasmania (NRET)**	
	Funds granted to TIA for the 1 January 2024 to 31 December 2024 financial year under the TIA Joint Venture Agreement, the Agricultural Innovation Fund and Other Grants	$6,492,611
	TOTAL NRET contribution	**$6,492,611**
3.	**Industry - including private industry and National Competitive Research grants**	
	2024 Industry research grants held by the University for TIA activities	$14,106,000
	TOTAL Industry contributions	**$14,106,000**

CERTIFICATION OF FINANCIAL DETAIL

We certify that the financial detail contained in the 2024 Tasmanian Institute of Agriculture Research Annual Report has been prepared in accordance with detail held in the University of Tasmania's Financial Management Information System, and detail provided by TIA.

Michael Rose
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