



Tasmanian Institute of Agriculture

2020 HIGHLIGHTS



ABOUT TIA

The Tasmanian Institute of Agriculture (TIA) is a specialised institute at the University of Tasmania that supports prosperous, innovative and sustainable agriculture and food sectors.

TIA was established in 1997 as a joint venture between the University of Tasmania and the Tasmanian Government, and has the objective of supporting prosperous, innovative and sustainable agriculture and food sectors in Tasmania.

Our researchers, educators, technical and professional staff work closely with partners across the agriculture and food value chain at a local, national and international level, ensuring that TIA's research and education priorities are responsive to industry needs, contemporary challenges and future opportunities.

TIA is home to the University of Tasmania's agricultural teaching discipline and has responsibility for undergraduate education and the training of higher degree research candidates who are vital to the industry's future prosperity.

TIA consistently delivers nationally and globally recognised research excellence and highly regarded engagement and impact rankings.



120+

SCIENTISTS AND
TECHNICAL EXPERTS



TOP 100-150

UNIVERSITY FOR
AGRICULTURE
(QS RANKINGS 2021)



100+

POSTGRADUATE
RESEARCH CANDIDATES



TOP 50

UNIVERSITY FOR AGRICULTURAL
SCIENCE (ARWU 2020)



COLLABORATION

RESEARCH CONDUCTED
IN COLLABORATION WITH
INDUSTRY PARTNERS



HIGHEST

HIGHEST POSSIBLE RANKINGS
FOR ENGAGEMENT AND IMPACT
(ARC ENGAGEMENT AND IMPACT
ASSESSMENT 2018-19)

Front page image: TIA Livestock Production Centre
Leader Dr James Hills.

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MESSAGE FROM TIA'S INTERIM DIRECTOR



The Tasmanian Institute of Agriculture (TIA) is committed to delivering highly relevant research, industry development and education to directly benefit the Tasmanian agriculture industry.

2020 proved to be a challenging year, but even during a global pandemic our dedicated staff achieved significant success towards this goal.

TIA celebrated a substantial \$7.4 million investment in our two research farms from the State Government and the University of Tasmania. This joint investment will see the Forthside Vegetable Research Facility and Elliott Dairy Research Facility transformed into centres of excellence to maximise their potential and deliver better outcomes for Tasmanian agriculture for the next decade.

A new \$6.5 million five-year partnership with Dairy Australia was announced for TIA to conduct ground-breaking research to help transform the Australian dairy industry. Our dairy research program continues to go from strength to strength and this partnership recognises TIA's expertise in delivering dairy-specific research and industry development.

TIA is focused on delivering distinctive courses that prepare graduates with the education they need to contribute to our communities. These courses draw directly from the innovative research we do.

In 2020 we expanded our portfolio of industry relevant education, with the development of a brand-new Masterclass in Dairy Farm Management to join the highly successful Masterclass in Horticultural Business.

The Masterclasses are supported by funding from Dairy Australia and Horticultural Innovation and have been developed to meet a growing demand for industry-specific training in business management and leadership to benefit the agriculture sector.

Additional highlights in 2020 include:

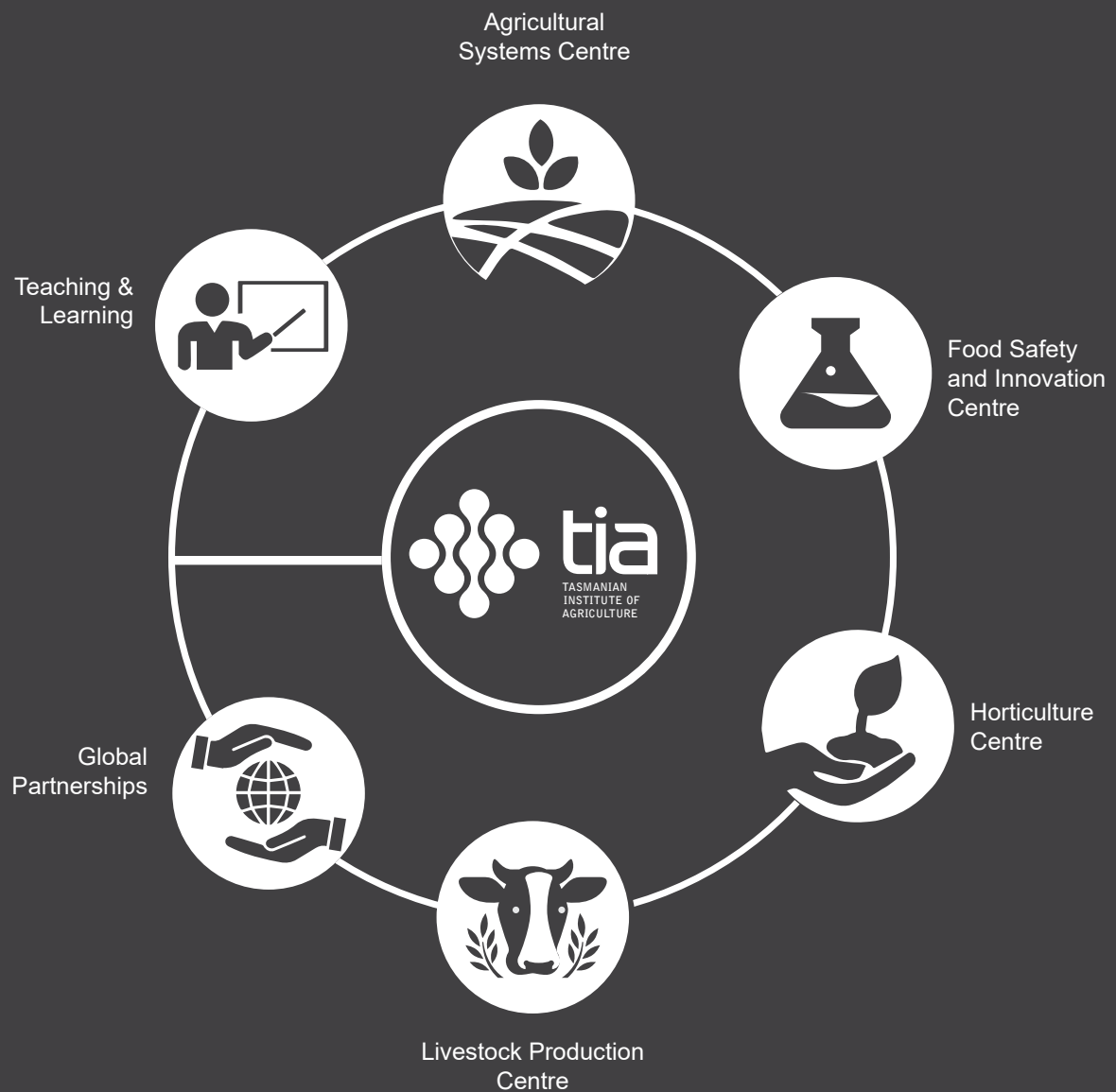
- A \$1.5 million research project to enhance the legume component of pastures, improving productivity and resilience for red meat producers.
- An \$800,000 research project to help Australian apple and pear growers stay at the leading-edge by better understanding the connection between healthy soils and productive orchards.
- Supporting the ongoing sustainability and profitability of Tasmania's potato industry through a new two-year project that will develop recommendations that will assist growers to better manage the impact of pink rot disease.
- TIA wine researchers contributed to a collaborative University of Tasmania team that developed a world-leading resource to empower local grape growers and winemakers to plan for the effects of climate change.
- TIA researchers were part of a \$455,000 project to improve the traceability of Australia's horticultural exports, allowing two-way tracing of horticultural products along the supply chain, enhancing compliance, food safety, and proof of provenance and authenticity.

We look forward to working with our key industry partners to build on this success in 2021 and beyond.

PROFESSOR MICHAEL ROSE

INTERIM DIRECTOR, TASMANIAN INSTITUTE OF AGRICULTURE

ORGANISATIONAL STRUCTURE



MESSAGE FROM TIA'S ADVISORY BOARD



The TIA Advisory Board advises on the strategic direction of agricultural research, development and extension activities undertaken by TIA. It comprises representatives from the University of Tasmania, the Tasmanian Government and the state's agricultural industries.

It was my pleasure to chair the Advisory Board during 2020, and I would like to thank each Board member for their work and flexibility despite the challenging circumstances presented by COVID-19. The Board worked collaboratively with TIA to continue delivery of the commitments set out in the RD&E White Paper, *Growing Tasmanian Agriculture: Research Development and Extension for 2050*.

Key initiatives delivered in 2020 included the commencement of the two-year *Extension Accelerator* program in 2020. This landmark program, coordinated by TIA, is providing development for early career agricultural extension professionals employed by Tasmanian agribusiness. Another milestone was the release of the *Plan for Tasmania's Research Farm Capacity* and the announcement of significant co-investment by the Tasmanian Government and the University to upgrade the research farms at Elliott and Forthside.

The Board's industry members established a closer liaison relationship with TIA Centre Leaders in 2020. This is providing a more direct avenue for communication between TIA and the Board and is strengthening TIA's close industry relationships across the agriculture and food value chain. The Board also endorsed new reporting measures to ensure that the RD&E undertaken by TIA continues to support productivity improvements for Tasmanian farmers and agribusinesses.

I thank the researchers, technical staff and professional staff at TIA for their work during a year that was disrupted by COVID-19 restrictions. I particularly thank Professor Mike Rose for his leadership in 2020, and for the work he has done in ensuring that TIA remains at the forefront of agricultural research and education.

I also acknowledge the hard work over the past six years of Ms Mel Rae, Dr Hazel MacTavish-West and Dr Davina Gregory-Dunsmuir who have stepped down from their positions as industry members on the Board. A process is underway to appoint three new industry members, and I look forward to working with both new and continuing Board members in the years ahead.

TIM BAKER

CHAIR, TASMANIAN INSTITUTE OF AGRICULTURE ADVISORY BOARD
SECRETARY, DPIPWE



**The Tasmanian Institute of
Agriculture (TIA) is committed
to delivering highly relevant
research, industry development
and education to directly
benefit the Tasmanian
agriculture industry.**



HORTICULTURE
CENTRE

Getting hands dirty for better apples and pears

Project: [Improved Australian apple and pear orchards soil health and plant nutrition](#)

Funding body: Hort Innovation

Industry partners: NSW DPI, Ag Victoria, Apple and Pear Growers Association of South Australia Inc, Pomewest and R and R Smith

Research team: Swarts, ND; Bound, SA; Close, DC; Buntain, M; Hardie, MA; Glen, M

In 2020 TIA commenced a \$800,000 research project to help Australian apple and pear growers stay at the leading-edge by better understanding the connection between healthy soils and productive orchards.

“Healthy soils play a critical role in the productivity of orchards through enhanced nutrient availability and resilience to climate variability,” Research lead Dr Nigel Swarts said.

“This project aims to develop the knowledge to help further optimise soil health and support apple and pear orchard production systems



that maximise quality and yield with high nutrient use efficiency, under increasingly variable climates.”

The project is part of the apple and pear industry’s Productivity, Irrigation, Pests and Soils (PIPS3) program.

Giving wine producers a competitive edge

Project: Pinot Noir provenance: Australian benchmarking to support growing, making, perception of quality, and marketing to add value to the Pinot Noir supply chain

Funding body: Wine Australia

Industry partners: Australian Wine Research Institute, Wine QT, Shaw + Smith and Hill-Smith Family Vineyards

Research team: Kerslake, FL; Lewis, GK; Close, DC; Merry, AM; Damberg, R; Doyle, RB; Mirowski, LT; Turner, P; Rose, L; Wadewitz, A; Sharpe, S; Smith, P; Longo, R; Carew, ALJ

Researchers at TIA are investigating how Pinot Noir wine characteristics could be used to prove provenance and help the industry better market their product.

Project lead, Dr Fiona Kerslake, said it was important for the team to understand how the different Pinot Noir styles were made in order to establish whether flavour and aroma of the wines were shaped by the wine making process or provenance.

TIA Research Fellow Dr Rocco Longo, who ran the wine chemistry experiments within the project, said despite the wines being produced using different wine making techniques, they were broadly similar within a region and distinct from those of other locations.



Empowering wine communities to map their climate future

Project: Australia's wine future - adapting to short-term climate variability and long-term climate change

Funding body: Wine Australia

Industry partners: Collaborative research project led by the Antarctic Climate Ecosystems Cooperative Research Centre in partnership with the South Australian Research and Development Institute, the Australian Wine Research Institute, CSIRO Marine and Atmospheric Research and the Tasmanian Institute of Agriculture.

Research team: Harris, R; Hayman, P; Remenyi, TA; Kerslake, FL; O'Kane, TJ; Katzfey, J; Thomas, D; Petrie, P; Sadras, V; Krstic, M; Bindoff, NL; Close, DC; White, CJ; Corney, SP



Image: Credit Wine Australia

TIA wine expert, Dr Fiona Kerslake, was part of a University of Tasmania research team who developed a world-leading resource to empower local grape growers and winemakers to plan for the effects of climate change.

The 'Climate Atlas' predicts how climate change will impact wine regions over the next 80 years and is tailored for individual regions and grape varieties.

This resource will help inform adaptation planning decisions so that the Australian wine community can continue to maintain grape yields, value and quality into the future.

[Download the Atlas](#)

Building back-up for bees

Project: Novel technologies and practises for the optimisation of pollination within protected cropping environments

Funding body: Tasmanian Government "Agricultural Innovation Fund"

Industry partners: Staphyt Australasia, NSW Dept. of Primary Industry

Research team: Barry, KM; Evans, KJ; Buntain, M

Researchers from TIA are looking to cherry orchards and onion seed crops to pursue the development of a mechanised pollination system as a form of 'bee insurance' and to improve crop performance for growers.

Mechanical pollination involves humans intervening and physically collecting pollen from flowers and reapplying it when and where it is needed.

Mechanical pollination is just one element of a safety net being developed to ensure horticultural crops are pollinated in a worst-case scenario. The broader national research program, funded by Rural



R&D for Profit, is investigating alternative pollinators such as flies and stingless bees, revegetation of native insect habitat and bee health under protected cultivation systems.

Crop protectants for blueberry rust

Project: Expanding crop protection options for control of blueberry rust

Funding body: Tasmanian Government - Agricultural Innovation Fund

Industry partners: Staphyt Pty Ltd and NSW Department of Primary Industries

Research team: Barry, KM; Evans, KJ; Buntain, M

TIA is evaluating a range of crop protectants for blueberry rust disease, which occurs in isolated locations in Tasmania.

There are currently limited crop protection options available to growers to help prevent blueberry rust infection, particularly for organic producers.

This project aims to improve industry access to crop protectants that are effective against blueberry rust, especially products that are acceptable to organically-accredited growers.



The goal is to provide growers with additional options to reduce biosecurity risk and maintain crop productivity and market access.

Findings will also be relevant to conventional growers and blueberry growers in all states of Australia

Undercover operation to boost cherry production

Project: Protected cropping for high value horticultural production: effects of climate modification and growing systems using cherry as a case study

Funding body: Hort Frontiers Leadership Fund, part of the Hort Frontiers strategic partnership initiative developed by Hort Innovation, with co-investment from TIA and contributions from the Australian Government. This project is also supported by Fruit Growers Tasmania.

Industry partners: Reid Fruits and Hansen Orchards

Research team: Stone, C; Close, DC; Bound, SA



TIA PhD candidate Cameron Stone is helping Tasmanian cherry growers produce the best quality fruit by studying how different cover systems impact fruit quality and tree health.

The project is investigating the role that humidity and temperature play in the overall quality of fruit by collecting weather data and measuring sap flow, as well as looking at the role different tree canopy shapes have on fruit quality.

Nitrogen tracing for improved tree and fruit nutrition

Project: Improved productivity and profitability for the Australian apple and pear industry

Funding body: Hort Innovation

Industry partners: Lucaston Park Orchards, Reid Fruits, Future Orchards, APAL

Research team: Swarts, ND; Close, DC; Hardie, MA; Bi, T

In an Australian first, TIA researchers have used nitrogen tracing technology to work out just how much nitrogen fertilizer an apple tree needs and when it needs it. This information along with climate, soil and apple life history data from around the country was combined into a grower friendly tool called SINATA. The SINATA tool was officially introduced to the apple industry in 2020 and will help growers predict their fertiliser and irrigation needs.

The app is being developed as part of a larger project to improve the production of consistent, high quality apples through a better understanding of tree nutrient management.

[Watch the video](#)



Research to support Tasmania's vital potato industry

Project: Investigating soil pH and nutrition as possible factors influencing pink rot in potatoes

Funding body: Hort Innovation

Industry partners: Simplot Australia, Serve-Ag (informal)

Research team: Tegg, RS; Rettke, M; Cotching, B; Beveridge, PW; Wilson, A; Wilson, CR



A new project by TIA will support the ongoing sustainability and profitability of Tasmania's potato industry.

The two-year project, led by TIA Senior Research Fellow Dr Robert Tegg, aims to develop recommendations that will assist growers to better manage the impact of pink rot disease in potatoes. The research will focus on understanding

the role that soil pH, acidifying fertilisers and elemental nutrients play in the occurrence of pink rot, and whether these can be modified to improve outcomes for growers.

The project will include pot trials, targeted field surveys of 20 potato paddocks, and two field trials in collaboration with local growers and agronomists.

PhD for prosperous poppies

Project: Developing a risk management system for systemic downy mildew of poppy

Funding body: Australian Research Council

Industry partners: Tasmanian Alkaloids (now Extractas Bioscience), Poppy Growers Tasmania and DPIPW

Research team: Dr Jason Scott, Dharushana Thanabalasingam



A PhD student's research aims to support the prosperity of Tasmania's poppy industry which has been battling a relatively new disease for the past six years.

Dharushana Thanabalasingam's research is focused on gaining a greater understanding of the relative importance of inoculum sources that spread systemic downy mildew.

"My main aim is to identify the roles played by the critical inoculum sources to spread systemic downy mildew disease in opiate poppies.

The inoculum sources include seed, soil and air and my aim is to find out which factor plays the biggest role in spreading the disease and how best to target it," she said.

"The findings of the research will inform effective management strategies which are essential to ensure the long-term viability of this important industry. This could include advice around the most effective times to apply fungicide, further insight about crop rotations, or possible biocontrol options."

Improving disease management for Tasmanian Pyrethrum Industry

Project: Integrated disease management in pyrethrum

Funding body: Hort Innovation

Industry partners: Botanical Resources Australia

Research team: Scott, JB; Pearce, T



With Tasmania's pyrethrum crop predicted to expand by 25 per cent this year due to increased consumer demand, this research is being well-received by industry.

New research indicates a potential win-win situation for Tasmanian pyrethrum growers, who could be able to increase yields while also reducing their input costs for disease control.

TIA's Dr Jason Scott has been working with Tasmanian pyrethrum growers and field agronomists from Botanical Resources Australia (BRA) to improve disease management for the industry – and the early results are promising.

"The results collected over the last couple of seasons are showing promising signs that we can help growers to reduce their fungicide usage without compromising yields," Dr Scott said.



With Tasmania's pyrethrum crop predicted to expand by 25 per cent this year due to increased consumer demand, this research is being well-received by industry.



**LIVESTOCK
PRODUCTION CENTRE**

\$6.5m research partnership to boost Australian dairy industry

Project: [Dairy High 2](#)

Funding body: Dairy Australia

Research team: Hills, JL;
Langworthy, A; Raedts, PJM; Gee,
CM; McLaren, D; Verdon, MJ;
Snare, TA; Millhouse, BJ

The Australian dairy industry will benefit from a new \$6.5 million partnership between TIA and Dairy Australia.

The substantial five-year agreement will deliver a national dairy research and industry development program to drive profitability and sustainability for Australian dairy farmers.

TIA Livestock Production Centre Leader, Dr James Hills said the program - called Dairy HIGH 2 (short for 'high integrity grass-fed herds') - would focus on feedbase research to help dairy farmers maintain efficient, profitable and sustainable pasture based dairy systems into the future.

"We are setting an ambitious target to help dairy farmers grow the same amount of dry forage matter from irrigated pasture, produce the same amount of milk solids per hectare, but halve the amount of nitrogen fertiliser," Dr Hills said.

Dairy Australia Managing Director, Dr David Nation, said the investment with TIA was an extension of a successful research partnership first commenced in 2012.

"The research is targeting significant sustainability gains in pasture production through efficient nitrogen fertiliser use and the reduction of a key input cost for dairy farms. It will directly benefit farmers in temperate pasture based dairy regions across Australia."

The partnership recognises TIA's expertise in delivering dairy-specific research and industry development



and combined with investments in the TIA Dairy Research Facility from the State Government and University of Tasmania will result in \$11 million invested in TIA's dairy research over the next five years.

A key part of the program will be the establishment of farmlets or 'mini farms' to test research theories under real farm conditions.

This innovative approach to research is not happening anywhere else in Australia and will involve managing four separate dairy herds under different pasture mixes at the TIA Dairy

Research Facility in Elliott, North West Tasmania.

The partnership incorporates a range of other activities within Dairy HIGH 2 including:

- Value-adding measures for non-replacement dairy calves.
- Pasture coaching and advanced workshops
- Dairy benchmarking and Dairy Business of the Year Awards
- Business groups
- On-farm discussion groups

Smarter irrigation for profit

Project: [Smarter Irrigation for Profit - Phase 2](#)

Funding body: Department of Agriculture and Water Resources

Industry partners: The project is led by Cotton Research and Development Corporation in partnership with four other RDCs and nine research organisations.

Research team: Hills, JL; McLaren, D; Flight, S; Rawnsley, RP; Jones S; Hardie, MA; Langworthy, A

TIA is proud to be part of phase two of the national Smarter Irrigation for Profit Program – bringing together industry, researchers and farmers to tackle the issue of reduced water availability and boost productivity for Australian farmers.

The program is focused on developing practical, cost effective strategies to improve on-farm water productivity.

In Tasmania the project will focus on a series of optimised irrigation farms linked to local groups of farmers and service providers. [Watch the video](#)



image credit: Chris Crerar

MooMonitor gives insight into grazing habits

Project: Dairy On PAR project

Funding body: Dairy Australia

Research team: Raedts, P; Hills, J; Gee, C



... the cows receiving the higher level of grain produced more milk, as expected, but did not graze as much grass in the paddock.

New research from TIA has revealed key insights into the grazing habits of dairy cows and the changes farmers can make to improve their bottom line.

Data was analysed from a project that monitored 180 dairy cows within the herd at TIA's Elliott Dairy Research Facility, being fed two different levels of a grain-based concentrate throughout an entire lactation period.

The team found that the cows receiving the higher level of grain produced more milk, as expected, but did not graze as much grass in the paddock.

These findings can help dairy farmers make better-informed, more profitable decisions, when looking to change the level of grains being fed.



Pasture management options for Tasmanian dairy farmers

Project: This research was part of the [Dairy High 1](#) project.



This has real potential to provide productivity, profitability and environmental benefits.

Agricultural Science honours student and TIA Dairy Extension Officer Samantha Flight has identified a new and potentially more profitable way for Tasmanian dairy farmers to manage their pastures.

The project examined if milk urea nitrogen (MUN) - based on the concentration of urea in milk - could be used by Tasmanian dairy farmers as an additional tool to decide when and how much nitrogen fertiliser to apply to their pastures.

"It appears that if MUN results are received on a regular basis, such as from bulk tank milk samples, it can provide farmers with a useful indication of when pastures are low



in nitrogen or when nitrogen levels are too high and fertiliser is being wasted," Ms Flight said.

"This has real potential to provide productivity, profitability and environmental benefits."

Establishing perennial legumes in red meat production pastures

Project: [Growing red meat productivity through the selection and establishment of perennial legumes](#)

Funding body: Meat and Livestock Australia (MLA) and Tasmanian Institute of Agriculture (TIA) and is part of the Livestock Productivity Partnership.

Industry partners: The Livestock Productivity Partnership (LPP) is a collaborative research and development partnership involving MLA Donor Company (MDC), TIA, NSW Department of Primary Industries, University of New England, University of Melbourne, and CSIRO, aimed at boosting livestock productivity and developing new R&D capacity.

Research team: Smith, RW; Martin, GI; Ball, PD; Penrose, B; Langworthy, A

Tasmanian red meat producers will benefit from a new \$1.5 million research project aimed at enhancing the legume component of pastures, improving productivity and resilience.

The five-year project, led by TIA Research Fellow, Dr Rowan Smith, will help grow productivity in the red meat industry by identifying and establishing perennial legume species that can successfully persist to fill feed gaps and improve tolerance and productivity under waterlogging.

The project is focused on improving legume proportions in the high rainfall regions of the North West Coast and low-medium rainfall region of the Tasmanian Midlands and working closely with local red meat producers to ensure findings are relevant and valuable.



Dairy extension delivers during lockdown

Project: [Dairy HIGH 1](#)

Funding body: Dairy Australia

Extension team: Irvine, L; Flight, S; Jones, S; Bakker, N

“

... the cows receiving the higher level of grain produced more milk, as expected, but did not graze as much grass in the paddock.

During 2020 industry engagement activities were significantly disrupted by COVID-19 restrictions and the usual delivery of on-farm regional discussion groups by the TIA Dairy Extension Team pivoted to online delivery.

Eight sessions were delivered to 263 participants with the online format enabling input from dairy experts in Ireland, New Zealand and around Australia.

An additional highlight during this challenging year for industry engagement, was the coordination and delivery of the Dairy Business of the Year Award and Share Dairy Farmer of the Year Award. Both awards were successfully delivered online featuring live interviews and virtual tours of farms and attracted excellent live engagement and viewing of the awards.



Dairy farm staff retainment research

Project: [Dairy HIGH 1](#)

Funding body: Dairy Australia

Research team: Turner, L; Hall, A

“

... in-depth interviews identified that long term staff retainment could be achieved when employers invested in the wellbeing and development of employees ...



Image Credit: Chris Crerar

A social research project has explored the issue of rapid staff turnover in the Tasmanian dairy industry, with survey data revealing at least 70% of owner-managers on Tasmanian dairy farms reported difficulties retaining staff.

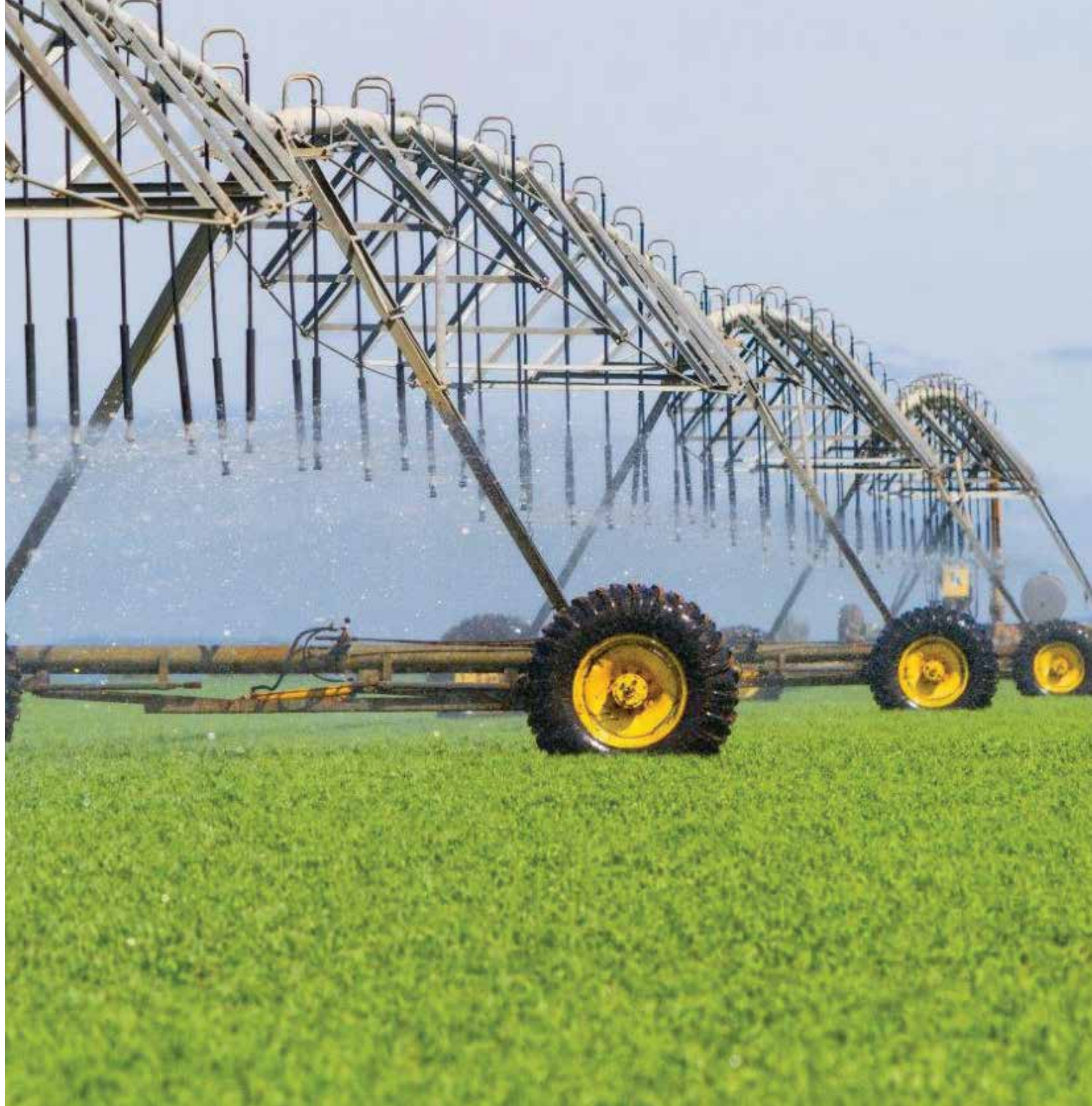
While significant and complex external factors influence staff turnover, in-depth interviews identified that long term staff retainment could be

achieved when employers invested in the wellbeing and development of employees and built shared ownership and trust among their team.

The research, which caught the attention of industry, informed the development of new training focusing on people management and was shared online and at a workshop requested by corporate farm managers.



The substantial five-year agreement will deliver a national dairy research and industry development program to drive profitability and sustainability for Australian dairy farmers.



**AGRICULTURAL
SYSTEMS CENTRE**

Using every drop of water wisely pays off

Project: [Water for Profit](#)

Funding body: Department of Primary Industries, Parks, Water & Environment

Industry partners: Pinion Advisory

Research team: Hinton, SJ; Mohammed, CL; Dean, GJ; Harrison, MT; Hardie, MA; Phelan, DC

Tasmanian farmers have benefitted from a specialised irrigation coaching program led by TIA which gave farmers custom advice and training to help them better manage their water.

TIA Agriculture Systems Leader, Professor Caroline Mohammed said the work built on the success of TIA's flagship irrigation program, Water for Profit.

"With the changing climate and three particularly dry winter seasons water is becoming a scarcer resource. Farmers are paying a lot for it and we want to help them use every drop as wisely as they can."

[Watch the video.](#)



Barley waterlogging tolerance improvement program

Project: [Barley waterlogging tolerance improvement program](#)

Funding body: Seed Force Pty Ltd

Industry partners: Seed Force Pty Ltd

Research team: Professor Zhou, M

TIA, in partnership with Seed Force, is developing a new variety of barley that will withstand extreme wet conditions with no negative impacts on its yield and quality.

The research will see the addition of a waterlogging tolerance gene to RGT Planet barley and builds on a previous TIA-led project that identified a major gene controlling the tolerance of waterlogging in barley.

With waterlogging a huge issue in high-rainfall zones around Australia yielding losses in barley crops of up to 50 per cent, the discovery has received significant interest from farmers and plant breeders eager for the gene to be incorporated into commercial varieties.



Research partnering with red meat producers

Project: [NEXUS project: exploring profitable, sustainable livestock businesses in an increasingly variable climate](#)

Funding body: Meat and Livestock Australia

Industry partners: The Livestock Productivity Partnership is a collaborative research and development partnership involving MLA Donor Company, TIA, NSW Department of Primary Industries, University of New England, University of Melbourne, and CSIRO

Research team: Harrison, MT; Turner, LR; Christie, KM; Ball, PD



Researchers from TIA are engaging directly with some of Tasmania's leading red meat producers to help the industry adapt to the challenges of climate change.

The national Nexus project led by Associate Professor Matt Harrison aims to equip livestock producers with

information on how climate change will affect their business, so they can make profitable and sustainable decisions into the future.

Industry input was an essential part of the project to help determine realistic change opportunities.

Microbes help researchers understand soil health

Project: [Smelling soil](#)

Funding body: CRC for High Performance Soils Ltd

Industry partners: Southern Farming Systems, Soils for Life, Birchip Cropping Group and FarmLink.

Research team: Powell, S; Mohammed, CL; Hardie, MA; Evans, KJ; Corkrey, SR; Bowman, JP

TIA researchers are developing an electronic nose prototype that could help farmers better understand their soil health by smelling what is happening underground, quickly and cheaply.

The eNose is designed to be an on-farm device providing real-time soil health testing that will produce more accurate results and the ability to track soil differences over time.

The device uses sensor technology to detect different soil compounds and create an 'aroma fingerprint' that will be used to show soil health.



Optimising limited irrigation water on grain crops

Project: [Optimising farm scale returns from irrigated grains: maximising dollar return per megalitre of water](#)

Funding body: Grains Research & Development Corporation

Industry partners: CSIRO, South Australian Research and Development Institute, Southern Growers

Research team: Harrison, MT; Ara, I; Phelan, DC

TIA is engaging with farmers to develop a new online tool to meet the needs of irrigated grain growers in Australia.

The project involves the development of a calculator called 'WaterCan Profit' that allows growers and agronomists to quickly estimate the profitability associated with irrigation water, given current water and grain prices, crop rotation, irrigation infrastructure and seasonal outlook. The calculator has been developed with grower groups across eastern Australia.

WaterCan Profit also allows comparison of long-term investment choices in different types of irrigation infrastructure.

The calculator has received interest from ag tech companies and is in the process of being commercialised.



Extension Accelerator Program

Project: [Extension Accelerator Program](#)

Funding body: Department of Primary Industries, Parks, Water & Environment

Industry partners: Department of Primary Industries, Parks, Water & Environment

Research team: Kumar, S; Steel, E; Mohammed, C



In 2020 TIA launched a pilot development program for graduates working in agricultural extension in Tasmania.

The Extension Accelerator Program provided participants with interactive training, extension case studies, mentoring and coaching, and the

opportunity to develop a professional network of peers.

Eleven participants enrolled in the 18-month program from across the agriculture industry, including seed production, consultancy, processing and horticultural production.

Barriers to buying locally grown produce

TIA researchers have looked at what stops Tasmanians from buying regionally grown fruit and vegetables and believe that more consistent labelling could be one of the answers to increasing intake.

“A lot of local producers are supported when people shop at the supermarkets, but a lack of labelling means that consumers might not even realise when local produce is on offer,” lead researcher Dr Beth Penrose said.

Ninety seven per cent of respondents rated purchasing regionally grown fruit and vegetables as high, showing a powerful desire to buy local and support Tassie growers and a big opportunity for local producers.



Sowing the seeds of success for the humble spud

Project: [Mapping potato yield and irrigation variability under climate change scenarios in Tasmania](#)

Funding body: JM Roberts Charitable Trust

Industry partners: Simplot, McCain, DPIPWE, several Tasmanian potato farmers

Research team: Ojeda, J; McPhee, J; Ara, I; Mulcahy, F; Webb, M

An innovative tool is being developed to help farmers, processors and policy makers predict potato yields from Tasmanian paddocks and the optimal time to plant and irrigate.

The project, which is supported by the 2020 JM Roberts Seed Funding for Sustainable Agriculture, aimed to address the challenge of crop yield variability.

“Our crop maps would allow you to see the main drivers of yield variability for your property and predict how many tonnes of potatoes per hectare you can expect,” Lead researcher Dr Jonathan Ojeda said.

The tool will provide information that would be impossible to obtain in the field and also show how different management strategies impact the crop yield.



Investigating the potential of hemp as a forage crop

Project: [Investigating the potential of hemp as a forage crop](#)

Funding body: AgriFutures and the Tasmanian Industrial Hemp Association

Industry partners: Tasmanian Industrial Hemp Association

Research team: Penrose, B

TIA research is exploring a new and potentially more profitable way for farmers to manage industrial hemp crops in Tasmania.

This two-year project is assessing the benefits of using industrial hemp exclusively as a forage crop for sheep or as a dual-purpose crop – for both grazing and seed production.

Industrial hemp is an emerging industry in Tasmania with the State supplying around 80 per cent of the total Australian production of low-THC hemp seed.



Smart soil sensors

Project: [Smart soil sensors](#)

Funding body: CRC for High Performance Soils Ltd

Industry partners: Federation University Australia; University of Southern Queensland

Research team: Hardie, MA; Cahoon, SC; Edwards, SJ; Gillespie, WJ; Manion, MJ; Kang, BH; Mohammed, CL

This research will develop the next generation of field-based sensors that can measure, map, interpret, and communicate sensor data using new approaches that meet growers' needs for information to make on-farm decisions.

The project includes the development of the 'smart' shovel which can measure soil moisture and salinity, below ground data transmission and self-learning moisture sensors.

It seeks to build and develop technologies and provide sensors with the functionalities that growers actually want.

[Watch the video](#)





**CENTRE FOR
FOOD SAFETY AND
INNOVATION**

A PhD predicting paneer

Project: Risk Assessment of Paneer

Funding body: ComBase, Dairy Food Safety Victoria

Research team: Sarker, D; Bowman, J; Tamplin, M; Wang, B (University of Nebraska, USA)

In a world-first, TIA PhD student Dipon Sarkar is developing predictive tools to inform food safety management decisions for the soft cheese, paneer.

The research is looking at how storage conditions can affect the growth of harmful pathogens in paneer and has involved spiking batches of paneer with pathogens in the lab to track how the cheese reacts.

Mr Sarkar is working in collaboration with partners in India to ensure his findings can be used to inform regulations, both here and internationally.



Campylobacter persistence in poultry processing

Project: Campylobacter persistence in poultry processing

Funding body: CSIRO

Industry partners: Queensland poultry meat processors

Research team: Chen, S; Bowman, J; Kocharunchitt, C (Jay), Duffy, L (CSIRO)



This project ... will contribute to public health policy and planning in the area of microbial food safety ...

Campylobacter is a food borne pathogen, most commonly found in chicken which can cause food poisoning and of which more cases are recorded in Australia than the well-known Salmonella.

This project is testing the hypothesis that levels of Campylobacter in

Tasmania are higher than those in other parts of Australia and will contribute to public health policy and planning in the area of microbial food safety in locally, nationally and internationally.

ARC Training Centre for Innovative Horticultural Products

The ARC Training Centre for Innovative Horticultural Products (TCIHP) continues to develop new knowledge enabling innovative solutions to commercial challenges for selected Australian-grown fruits and vegetables.

TCIHP developed science to maintain the integrity of perishable fresh produce in Australian supply chains and has secured a principal industry partner commitment of \$1M over five years for a second Training Centre with TIA/University of Tasmania.

TCIHP research has included and enabled: extension of shelf-life of baby leafy vegetables, sweet cherries, and 'fresh cut' fruits; mitigation of disorders and defects reducing product quality such as greening in potatoes and mango 'resin canal disorder' and technologies to minimise quality



loss of bananas during handling and transport.

Ten industry-ready postgraduate researchers have also been trained by the Centre and now have Australian

food industry placements. The Centre also helped refine the industry-focused skills of three early career PDFs who are now working in the Australian food industry.

Fresh herbs in high demand

Project: [ARC Training Centre for Innovative Horticultural Products](#)

Funding body: Australian Research Council (ARC) Industrial Transformation Research Program

Industry partners: Australian Government's Industrial Transformation Research Program, Woolworths

Research team: Wilson, M



TIA's Dr Matt Wilson has shown the potential of Electrolysed Oxidising Water (EOW) and CO₂ shock treatments to help extend the shelf-life of Australia's most popular herbs.

Fresh herbs are in high demand, with coriander, parsley, mint and basil accounting for 80% of the \$155 million Australian fresh herb industry.

Current shelf life can range from five days to three weeks depending on the packaging and storage conditions.

Improved shelf-life could help industry meet the growing year-round demand for fresh herbs and reduce fresh food waste in Australia.



Rockmelon industry to benefit from new recommendations

Project: [ARC Training Centre for Innovative Horticultural Products](#)

Funding body: Australian Research Council (ARC) Industrial Transformation Research Program

Industry partners: Woolworths

Research team: Ross, T; Stanley, RA; Close, DC; Tamplin, ML; Meinke, HB; O'Cass, AG; Gracie, AJ; Fei, J; Wilson, CR



TIA researchers have developed a set of new industry recommendations to improve Australian rockmelon food safety practices.

The project team worked in consultation with industry to understand the causes of a human listeriosis outbreaks from rockmelons and developed 12 key recommendations to help prevent future outbreaks, safeguard the reputation and productivity of the Australian rockmelon industry and provide consumers with confidence in the safety of Australian-grown melons.

Funded by Hort Innovation, the project was led by a team of experts from TIA, in consultation with New South Wales



Department of Primary Industries, University of Florida, Hort Innovation and private consultants.

Food quality and innovative processing

Project: Principal research organisation in microbial ecology and physiology (PROMEP)

Funding body: Meat and Livestock Tasmania (MLA)

Industry partners: Various meat processors (JBS etc.); collaborated with Prof S. Koseki, Hokkaido University Japan

Research team: Ross, T; Bowman, JP; Mellefont, LA; Kocharunchitt, C; Kaur, M

The PROMEP project, which has been active since 2016, focuses on the development and optimisation of chemical based safety interventions for red meat.

The project generated many findings related to better understanding the dynamics of vacuum packed (VP) red meat shelf-life.

Investigations better defined the microbiology and coupled to sensory data, developed an innovative shelf-life predictive models for VP lamb and VP beef. The model was tested in international and domestic supply chains working with different industrial partners.



Shelf-life extension of Australian beef and lamb

Project: Understanding microbial spoilage of Australian red meat for shelf-life model development and shelf-life extension

Funding body: (MLA)

Industry partners: Various Australian red meat processors

Research team: Kocharunchitt, C (Jay); Ross, T; Bowman, J; Mellefont, L; Pagnon, J; Rood, L; Kaur, M

The project follows on from the success of previous projects funded by Meat and Livestock Australia to understand microbial spoilage of Australian beef and lamb.

The aims of this project are to develop shelf-life predictive models for various red meat products, and a novel approach for shelf-life extension of vacuum-packed products which Australian red meat processors can use to better manage their cold chains (through assuring product quality and reducing testing costs) and for negotiations with export markets.



Predicting the effect of storage temperature on the shelf life of vacuum packed beef and lamb

Project: [Evaluation and predictive modelling of shelf life of frozen beef products in different packaging systems](#)

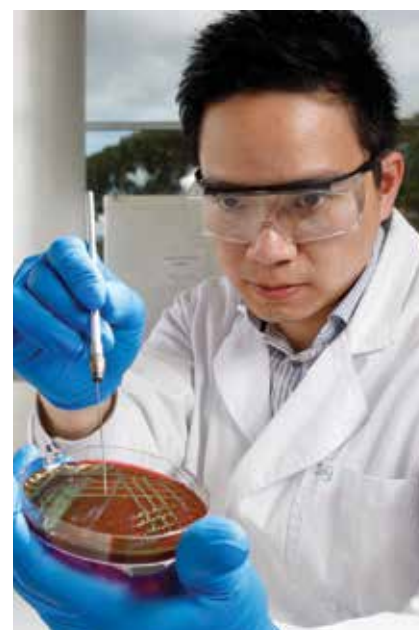
Funding body: Argyle Food Group; Meat & Livestock Australia (MLA)

Industry partners: Various Australian red meat processors

Research team: Kocharunchitt, C (Jay); Ross, T;

A long-term study at TIA aimed at determining the shelf life of various beef products in different packaging systems, has developed mathematical models to predict the effect of storage temperature on the shelf life of vacuum packed beef and lamb.

Helping to maintain Australia's solid reputation around the world for excellent meat shelf life, these shelf life prediction models are now available for meat processors and exporters to use to predict the shelf life of chilled vacuum-packed beef and lamb in general with the capability of being tailored to specific supply chains.





MATS provides leading research in Food Innovation

Work continues on one of the University's flagship research programs developing Microwave Assisted Thermal Sterilisation (MATS) technology to produce high quality shelf stable foods.

MATS technology combines the energy from microwaves of long-wavelength (915 MHz) along with hot water immersion to rapidly sterilise food in polymeric packages while preserving nutrition and "fresh cooked" flavours.

Centre for Food Innovation Director and TIA Food Science and Technology Professor Roger Stanley, said the technology had broad applications globally for food exports and sustainability of the supply chain.

"The MATS technology provides novel innovation options for making shelf stable and sterile packaged foods that retain high quality taste, allowing them to expand into new markets without a reliance on cold chain integrity and

avoiding biosecurity barriers," he said.

The high quality meals can be used in a broad range of settings including defence, emergency foods, restaurants, aged care and e-commerce sales of portion controlled ready meals direct to consumers.



GLOBAL IMPACT

Research Hub for Traditional Chinese Herbs

Project: Research Hub for Traditional Chinese Herbs

Funding body: W & E Health Pty Ltd (owned and managed by AEMG)

Research team: Close, DC; Boersma, M; Garland, SM



... establishing the potential for traditional Chinese herbs for growing and processing for a new export sector and further diversifying Tasmania's agricultural sector.

The research hub for traditional Chinese herbs is a joint investment by the Australian Education Management Group and the University of Tasmania through TIA, with the objective of establishing the potential for traditional Chinese herbs for growing and processing for a new export sector and further diversifying Tasmania's agricultural sector.

The hub is continuing to flourish, with positive initial findings on two herbs showing potential for commercial

cropping into the future, from two UTAS-based PhD candidates focussed on horticultural production and the physio-chemical quality of the medicinal herbs. Two PhD candidates have also started research from Nanjing University of Chinese Medicine with plans to conduct work in Tasmania.

The Tasmanian herb industry has shown support for the hub, working collaboratively with TIA.

International collaboration to explore the genetics of potato greening

Professor Calum Wilson and TIA's potato pathology group have commenced an international collaboration with the US Department of Agriculture (USDA) to examine the physiology of greening resistance in wild potatoes.

The group had previously found that commercial potato cultivars that have increased resistance to light-induced tuber greening, also have increased

waxes on their skins which may be acting as a natural sunscreen.

Work in the US has shown that certain lines of wild potato species have very strong resistance to light induced greening. The team will examine these lines to determine whether tuber skin suberin content is associated with this resistance trait as was found in commercial potatoes.



From paddock to pallet to plate

Project: [Enhancing horticultural supply chain traceability and digital promotion of Australian horticultural products in overseas markets \(2020-2023\)](#)

Funding body: Department of Agriculture

Research team: Fei, J (AMC); Close, D (TIA); Cahoon, S (Sense T); Kumar, S (TIA); Kumar, D (TIA)



Tasmania's booming horticultural exports to China will be enhanced by new applications of technologies to traceability and authenticity to be developed by a UTAS team including Associate Professor Johnny Fei of AMC, Associate Professor Stephen

Cahoon of Sense-T and TIA's Professor Dugald Close.

The research aims to develop a system that will allow two-way tracing of horticultural products along the supply chain, providing for streamlined proof of provenance and authenticity.

Research tackles abiotic crop stress as part of global food security

The laboratory's major research projects include:

Project: Revealing Enigma of Salt Bladders to Help Crops Cope with Salinity

Funding body: Australian Research Council

Research team: Shabala S; Hedrich R

Project: Developing Salt Tolerant Rice for Food Security in India and Australia

Funding body: Department of Industry, Science, Energy and Resources

Research team: Shabala, S; Zhou, M; Shabala, L; Meinke, H; Chen, Z; Venkataraman, G; Parida, A

Climate-driven abiotic stresses, including drought, salinity, low or high temperatures, and other environmental extremes, represent huge losses in crop production annually and are a major threat to global food security.

TIA's Stress Physiology Laboratory, led by Professor Sergey Shabala, is comparing key mechanisms and genes that underly superior salinity, drought, and flood tolerance in wild relatives of modern cereal crops (wheat, rice, barley) and developing strategies to reinsert them back into elite germplasm.



FINANCIAL REPORT

TASMANIAN INSTITUTE OF AGRICULTURE (TIA)

NOTES TO ACCOMPANY FINANCIAL DETAILS

The financial details reported here relate to TIA activities for 2020. 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

2020 Operating Grant Funds to TIA/School of Agricultural Science	\$5,526,023
2020 University Research Scholarships to PhD students studying in areas related to TIA activities	\$1,240,859

TOTAL University of Tasmania contribution	\$6,766,882
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2. Department of Primary Industries, Parks, Water & Environment (DPIPWE)

CRF funds granted to TIA for the 1 January 2020 to 31 December 2020 financial year under the TIA Joint Venture Agreement	\$5,731,184
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TOTAL DPIPWE contribution	\$5,731,184
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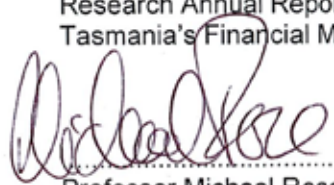
3. Industry - including private industry and National Competitive Research grants

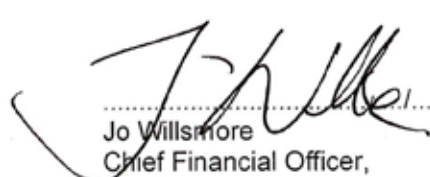
2020 Industry research grants held by the University for TIA activities	\$8,230,839
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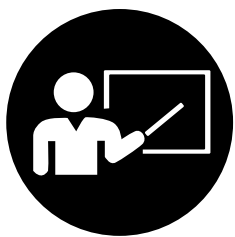
TOTAL Industry contributions	\$8,230,839
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CERTIFICATION OF FINANCIAL DETAIL

We certify that the financial detail contained in the 2020 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.

 30/3/2021
.....
Professor Michael Rose
Acting Director TIA

 29/03/21
.....
Jo Willshire
Chief Financial Officer,
Financial Services
University of Tasmania



**LEARNING AND
TEACHING**

Masterclass in Dairy Farm Management

Project: [Masterclass in Dairy Farm Management](#)

Funding body: Dairy Australia

Partners: Dairy Australia and national industry steering committee

Research team: Gracie, AJ; Boersma, M; Acuna, TL; Hills, J

The success of the Masterclass in Horticultural Business, which commenced in 2017, led to the national dairy sector requesting a similar program for its constituents and consequentially the development by TIA of a new Masterclass in Dairy Farm Management that will be open to enrolments in 2021.

Through research, the dairy industry has identified a shortage of people and capability in farm management as one of the top four areas limiting growth of the industry over the next 10 years.

Both programs are accredited as a Graduate Diploma in Agribusiness, with specialisations in Dairy Management or Horticultural Business.



Further study opportunities

During 2020, TIA made a number of exciting changes to its offerings for commencement in 2021 including:

- Delivery of a Graduate Diploma in Agribusiness;
- Changes to its Bachelor of Agricultural Science (honours) with students now having the opportunity to elect professional honours (including work integrated learning and industry case studies) or research honours comprising an individual research project in their final year of study;
- A new major in the Bachelor of Science called 'Food Innovation and Safety' for delivery from Launceston.



Inaugural Nuffield Scholarship for Young Leaders in Sustainable Agriculture

Charles Downie from Gretna was announced as the inaugural recipient of the [Nuffield Farming Scholarship](#), which he will use to investigate how the establishment of training modules and programs in agricultural businesses can help better attract an existing workforce to meet short-term labour requirements.



The scholarship is aimed at providing invaluable experience and connections for Tasmania's emerging agricultural leaders.

Aimed at providing invaluable experience and connections for Tasmania's emerging agricultural leaders, the Nuffield Scholarship is valued at \$30,000 and is supported by the Tasmanian Institute of Agriculture (TIA) and the JM Roberts Charitable Trust.

The scholarship provides recipients with the opportunity to learn about the international agricultural marketplace and bring this knowledge back home to better manage their operation and add value to our local communities and industries.



Students learn about the diversity of agricultural careers

Year 11 and 12 students were introduced to the diverse career opportunities available in agriculture through a one-day tour as part of the [Feed Your Mind. Feed the World](#) experience.

Students were introduced to a variety of agricultural operations and the science underpinning their success. These operations include vineyards, fruit, vegetable and dairy producers and value adding activities.

The annual outreach event showed students that studying agricultural science could lead to many careers that support the sector such as wine research, food safety, soil science and agronomy.



TIA Career Forum and Industry Panel

In October TIA hosted two online education events: the TIA Career Forum and TIA Industry Panel. The career forum was attended by 38 students and 13 employers from both Tasmania and interstate.

The online platform allowed students to attend either group chats and presentations from employers or to have direct one-on-one conversations.

The industry panel event saw three graduates (Rohan Kile from Costa Group, Olivia Woodiwiss from Pinion Advisory and Olivia Churchill from Tassal Group) talk to students about their careers paths.



Honours seminar success

TIA hosted the 2020 honours student seminars, showcasing the next talented crop of agricultural scientists. More than 180 people attended in person and via livestream to hear the students present their industry relevant research.

The topics were diverse, from the spread of powdery mildew in strawberries and the use of growth regulators in Tasmanian industrial hemp, to the persistence of temperate perennial forage legumes.

The presentations are available to [watch online](#)



2020 TIA RESEARCH PROJECTS

FUNDING BODY	INDUSTRY PARTNERS	RESEARCH TEAM	TITLE OF PROJECT
AG SYSTEMS			
AgriFutures	Tasmanian Hemp Association	Penrose, B; Field, B; Donoghue, A	Investigating the potential of hemp as a forage crop
AgriFutures		Field, B	AgriFutures Pastures Seeds Industry Advisory Panel
Australian Centre for International Agricultural Research		Healey, M; Glen, M; Mohammed, CL	Developing a biosecurity network in SE Asia - project scoping
Australian Centre for International Agricultural Research	Centre for Agrarian Systems Research and Development; Centre for International Research Agronomic Development; National Institute of Animal Sciences; Northern Mountainous Agriculture and Forestry Science Institute; Tay Bac University; Thai Nguyen University of Agriculture and Forestry; University of Queensland; Vietnam National University of Agriculture	Ives, SW; Bonney, L; Eversole, R; Adhikari, RP; Nicetic, O; Cuong, VC; Huyen, LTT; Hung, PV; Quang, NH; Lan, DD; Xuan, CTT; Duteurtre, G; Smith, RW	Intensification of beef cattle production in upland cropping systems in North West Vietnam
AW Howard Memorial Trust		Penrose, B	Are nutrients limiting legume nodulation in Tasmanian dairy pastures?
CRC for High Performance Soils Ltd	Charles Sturt University; University of Southern Queensland	Higgins, VJ; Warman, R; Bryant, M; Allan, C; Cockfield, G; Leith, PB	Understanding Adoptability of Techniques and Practices for Improved Soil Management
CRC for High Performance Soils Ltd	Federation University Australia; University of Southern Queensland	Hardie, MA; Cahoon, SC; Edwards, SJ; Gillespie, WJ; Manion, MJ; Kang, BH; Mohammed, CL	'Smart' soil sensors
CRC for High Performance Soils Ltd		Glen, M; Mohammed, CL; Corkrey, SR	Microbial changes associated with improved or reduced soil health
CRC for High Performance Soils Ltd		Hardie, MA; Maya Alejandro, F; Gale, TJ	Mobile soil water extraction for biological and chemical analysis
CRC for High Performance Soils Ltd	Birchip Cropping Group; FarmLink Research Limited; Southern Farming Systems Ltd	Powell, S; Mohammed, CL; Hardie, MA; Evans, KJ; Corkrey, SR; Bowman, JP	Smelling soil
CSIRO-Commonwealth Scientific & Industrial Research Organisation		Ojeda, JJ; Leith, PB; Waha, K	PhD project: The benefits and limits of diversity in agricultural systems
Department of Agriculture and Water Resources	R&R Smith PTY LTD; Reid Fruits	Penrose, B; Bound, SA	Increasing resilience and building capacity in orchards through permanent soil cover
Department of Foreign Affairs and Trade	Universidad Nacional de Entre Rios; University of Southern Queensland	Ojeda, JJ; Ara, I; Aryal, J	Crop-livestock adaptation to climate change based on modelling and remote-sensing
Department of Industry, Innovation and Science	CRC for High Performance Soils Ltd; University of Newcastle	Doyle, RB; Mohammed, CL; Hardie, MA; Neumeyer, PG; Cotching, Bill; Cahoon, SC	CRC for High Performance Soils

FUNDING BODY	INDUSTRY PARTNERS	RESEARCH TEAM	TITLE OF PROJECT
Grains Research & Development Corporation		Zhou, M; Johnson, PG	Minimising the impact of major barley foliar pathogens on yield and profit: Screening of elite breeder material transitioning to a fee for service model
Grains Research & Development Corporation		Dean, GJ	National Variety Trials (NVT)
Grains Research & Development Corporation		Zhou, M; Johnson, PG; Fan, Y	Introgressing waterlogging tolerance gene to commercial barley varieties
Grains Research & Development Corporation		Li, C; Zhou, M; Broughton, S; Zhang, X	Improved Adaptation of Barley to Acid Soils
Grains Research & Development Corporation	Department of Economic Development, Jobs, Transport and Resources	Armstrong, R; Wilhelm, N; Davenport, D; Sale, P; Tavakkoli, E; Dean, GJ; McPhee, JE; Hardie, MA; Johnson, PG	Understanding the amelioration processes of the subsoil application of amendments in the Southern Region
Grains Research & Development Corporation		Harrison, MT; Ara, I; Phelan, DC	Optimising farm scale returns from irrigated grains: maximising dollar return per megalitre of water
Horticulture Innovation Australia		McPhee, JE; Monckton, DC	Wide Span farming: economic and logistics feasibility study
JM Roberts Charitable Trust		Evans, KJ; Leith, PB; Kumar, S	JM Roberts Seed Funding for Sustainable Agriculture
Martha Jane Medical		Acuna, TL	Production and quality of industrial hemp (Cannabis sativa) in response to water regime
Meat and Livestock Australia	Meat and Livestock Australia; University of Tasmania	Harrison, MT; Turner, LR; Christie, KM; Ball, PD	NEXUS project: exploring profitable, sustainable livestock businesses in an increasingly variable climate
Meat and Livestock Australia	Meat and Livestock Australia; University of Tasmania	Smith, RW; Martin, GI; Ball, PD; Penrose, B; Langworthy, A	Growing red meat productivity through the selection and establishment of perennial legumes
Seed Force Pty Ltd		Zhou, M; Lovell, R	Barley waterlogging tolerance improvement program
South Australian Research and Development Institute		Smith, RW; Martin, GI	Australian Pastures Genebank - Temperate Regeneration and Characterisation Program
Universities Australia / Deutscher Akademischer Austauschdienst (German Academic Exchange Service)		Ojeda, JJ	Towards high water productivity in agriculture based on multi-scale modelling
FOOD SAFETY			
Australian Research Council	Apple and Pear Australia Ltd; Australian Melon Association Inc.; Center for Produce Safety USA; Coles Supermarkets Australia Pty Ltd; Compac New Zealand; CSIRO Food & Nutrition Flagship; Fresh Produce Safety Centre Ltd; Fresh Select Australia Trust; Freshcare Limited; Freshmax Australia Pty Ltd; Golden State Foods Fresh Australia; Harris Farm Markets Pty Ltd; Middlebank Consulting Group; New South Wales Office of Science and Medical Research; New Zealand Institute for Plant & Food Research Limited; NSW Food Authority; One Harvest Pty Ltd; Pip Fruit New Zealand; University of California Davis; University of Sydney	McConchie, R; Carter, D; Bell, T; Jones, B; van Ogtrop, F; Deaker, R; Wilson, N; Evans, B; Phan-Thien, KY; Worthington, M; Cole, M; Bowman, JP; Bennett, R; Suslow, T; Win, A; Fletcher, G; Moir, C; Fernandez-Fenaroli, B; Fullelove, D; Crouch, M; Hamilton-Bate, C; Thomas, C; Bradfield, D; Gilbertson, R; Walker, B; Jansson, E; Tarrant, S; Field, M; Soich, N; Farrow, A	ARC Training Centre for Food Safety in the Fresh Produce Industry

FUNDING BODY	INDUSTRY PARTNERS	RESEARCH TEAM	TITLE OF PROJECT
Australian Research Council		Bowman, JP	College of Experts 2017-2019 - Associate Professor John Bowman
CSIRO-Commonwealth Scientific & Industrial Research Organisation; Tassal Ltd		Bowman, JP; Powell, S	Investigating opportunities to influence gastrointestinal microbiota in farmed Atlantic salmon and potential microbiome associated practices to improve health and productivity
Defence Science and Technology Group		Nation, T; Hinton, SJ	CFI Agreement -Commercial Co-investment Establishment Program, Phase 1
Department of Primary Industries NSW		Pecl, GT; Cullen-Knox, C; Fudge, ME	Socio-ecological research to support Marine Estate Management
McCain Foods Limited		Stanley, RA; Hinton, SJ; De Vries, J	MATS Process Stability Testing
Meat and Livestock Australia		Ross, T; Bowman, JP; Mellefont, LA; Kocharunchitt, C; Kaur, M	Principal research organisation in microbial ecology and physiology
HORTICULTURE			
Advanced Agricultural Systems Pty Ltd		Bound, SA	Developing Agri-tech solutions for the Australian apple Industry
AgAware Consulting Pty Ltd		Scott, JB; Clark, DD; Donoghue, A; Goulding, KJ	Trials to determine the efficacy and crop safety of Switch Fungicide (cyprodinil + fludioxonil) in hemp for the control of grey mould.
Australian Research Council		Wilson, CR; Nichols, DS	Manipulating plant root exudation for soil-borne disease control
Australian Research Council	Australian Wine Research Institute; AUSVEG Ltd; Bioplatforms Australia Ltd; Cotton Research and Development Corporation; Curtin University; Grains Research & Development Corporation; Griffith University; Horticulture Innovation Australia; La Trobe University; NUFARM AUSTRALIA LIMITED; Queensland Department of Agriculture & Fisheries; South Australian Research and Development Institute; University of California, Riverside; University of Queensland; Wine Australia	Mitter, N; Evans, KJ	BioClay Sustainable Crop Protection
Australian Research Council	Department of Primary Industries, Parks, Water & Environment; Poppy Growers Tasmania Inc; SunPharma Australia; Tasmanian Alkaloids Pty Ltd; TPI Enterprises Pty Ltd; United States Department of Agriculture	Scott, JB; Wilson, CR; Gent, D	Development of a risk management system for systemic downy mildew of poppy
BioAg Pty Ltd; Department of Industry, Innovation and Science		Quin, PR	Analysis of a proprietary liquid biostimulant
Botanical Resources Australia Pty Ltd		Pearce, T; Pilkington, S	Tissue culture techniques for pyrethrum
Botanical Resources Australia Pty Ltd		Scott, JB; Pearce, T	Mechanisms and spread of fungicide resistance in pyrethrum fungal pathogens
Botanical Resources Australia Pty Ltd		Pearce, T; Pilkington, S; Scott, JB	Investigating the genetics of pyrethrum vernalisation
Botanical Resources Australia Pty Ltd		Garland, SM; Gracie, AJ; Close, DC	Accumulation of STLs in pyrethrum extract

FUNDING BODY	INDUSTRY PARTNERS	RESEARCH TEAM	TITLE OF PROJECT
Cooperative Research Centre for Honey Bee Products; Tasmanian Beekeepers		Garland, SM; Close, DC; O'Grady, AP	The bioactivity and stability of the honey from Leatherwood (<i>Eucryphia lucida</i>)
CSIRO-Commonwealth Scientific & Industrial Research Organisation; GreyScan Pty Ltd		Breadmore, MC; King, AE; Karupiah, G; Flies, AS; Wilson, CR; Flies, E; Gell, DA	ICG - GREYSCAN PTY LTD
Department of Agriculture		Jones, JE; Rodemann, T; Close, DC; Dambergs, RG	Taking grapevine yield forecasting into the digital age
Department of Agriculture	Cotton Research and Development Corporation; Horticulture Innovation Australia	Swarts, ND	Optimising nutrient management for improved productivity and fruit quality in cherries
Department of Agriculture		Fei, J; Close, DC; Cahoon, SC; Bonney, L; Kumar, S	Enhancing horticultural supply chain traceability and digital promotion of Australian horticultural products in overseas markets
Department of Agriculture and Water Resources		Longo, R; Kerslake, FL; Dambergs, R	A new tool for in-line and real-time grape juice assessments
Department of Agriculture and Water Resources	Hansen Orchards; Reid Fruits; Seed Purity; South Pacific Seeds Pty Ltd	Gracie, AJ; Allen, GR; Close, DC; Quarrell, SR; Jones, JE; Barry, KM	Novel technologies and practices for the optimisation of pollination within protected cropping environments
Department of Premier and Cabinet	Biosecurity Tasmania	Harris, R; Remenyi, TA; Horton, BJ; Harrison, MT; Quarrell, SR; Corkrey, SR; Westmore, G	Evaluation of the susceptibility of Tasmania's agricultural sector to insect pest species under a changing climate
Department of Primary Industries, Parks, Water & Environment	Ralph's Tasmanian Seafood Pty Ltd	Keane, JP; Swarts, ND	Commercial upscaling of urchin fertiliser
Department of Primary Industries, Parks, Water & Environment		Barry, KM; Evans, KJ; Buntain, M	Expanding crop protection options for control of blueberry rust
Diemen Pepper		Barry, KM; Wilson, MD; Brodribb, TJ; Cahill, D	Developing tools to screen native pepper for resistance to dieback and tolerance to drought
Essential Oils of Tasmania		Garland, SM	Essential Oils of <i>Kunzea</i> Ecotypes
Essential Oils of Tasmania		Close, DC; Menary, RC; Claye, CJ	Boronia germplasm collection re-vitalisation
Foshan University		Barry, KM; Shabala, SN	Foshan University Researcher Training and PhD Scholarship Program
Horticulture Innovation Australia		Swarts, ND; Close, DC; Hardie, MA	Improved productivity and profitability for the Australian apple and pear industry
Horticulture Innovation Australia	Department of Primary Industries, Parks, Water & Environment; IPM Technologies; Raspberries & Blackberries Australia	Quarrell, SR; Allen, GR; Buntain, M; Daveis, J; Horne, P; Eccles, J	Integrated Pest Management of redberry mite, <i>Acalitus essigi</i> , on blackberries
Horticulture Innovation Australia		Wilson, CR; Tegg, RS; Eyles, A; Baldwin, S	Mechanisms and manipulation of resistance to powdery scab in potato roots
Horticulture Innovation Australia	Botanical Resources Australia Pty Ltd	Scott, JB; Pearce, T	Integrated disease management in pyrethrum
Horticulture Innovation Australia	Fruit Growers Tasmania Inc	Bound, SA; Buntain, M; Cover, I; Tarbath, M; Westmore, G; Crisp, P; James, P	Pilot Sterile Codling Moth Releases for the Apple industry
Horticulture Innovation Australia		Gill, WM; Close, DC	Pest and disease management and research services
Horticulture Innovation Australia	Applied Horticultural Research Pty Ltd; Queensland Department of Agriculture & Fisheries	Wilson, CR; Tegg, RS; Montagu, K; Duff, J	Optimising cover crops for the Australian vegetable industry
Horticulture Innovation Australia	South Australian Research and Development Institute	Wilson, CR; Rettke, M; Tegg, RS; Beveridge, PW	Field and laboratory trials for understanding disease risk in potatoes
Horticulture Innovation Australia		Close, DC; Gracie, AJ; Boersma, M	National PhD Program: Horticulture

FUNDING BODY	INDUSTRY PARTNERS	RESEARCH TEAM	TITLE OF PROJECT
Horticulture Innovation Australia		Williams, David; Villalta, O; McCutcheon, A; Cunningham, P; Santhanam-Martin, M; Mathews, A; Murphy-White, S; Learmonth, S; Sutton, J; Lacey, K; Dodds, K; Coleman, A; Nimmo, P; McGrath, C; Quarrell, SR; van Helden, M; James, P	An integrated pest, disease and weed management program for the Australian apple and pear industry
Horticulture Innovation Australia	Wageningen UR	Boersma, M; Close, DC; Gracie, AJ; Acuna, TL; Bigsby, H	Global master class in horticulture
Horticulture Innovation Australia	Department of Agriculture and Fisheries (QLD); Department of Economic Development, Jobs, Transport and Resources; Department of Primary Industries and Fisheries, NT; Department of Primary Industry and Resources	Wilson, CR; Gambley, C; Constable, F; Tran Nguyen, L; Coutts, B	VG16086 - Area-wide management of vegetable diseases: viruses and bacteria
Horticulture Innovation Australia	Department of Jobs, Precincts and Regions	Lefoe, G; Quarrell, SR	Strengthening cultural and biological management of pests and diseases in apple and pear orchards
Horticulture Innovation Australia		Tegg, RS; Rettke, M; Cotching, Bill; Beveridge, PW; Wilson, A; Wilson, CR	Investigating the soil pH and nutrition as possible factors influencing pink rot in potatoes - a pilot study
Horticulture Innovation Australia	Department of Jobs, Precincts and Regions	Goodwin, Ian; Bound, SA	Developing smarter & sustainable pear orchards to maximise fruit quality, yield & labour efficiency (AP19005)
Horticulture Innovation Australia	Fruit Growers Tasmania Inc	Close, DC; Bound, SA	Protected cropping for high value horticultural production: effects of climate modification and growing systems using cherry as a case study
Horticulture Innovation Australia		Allen, GR; Quarrell, SR; Gracie, AJ	Honey bee health and pollination under protected and contained environments
Horticulture Innovation Australia	Biocontrol Australia Pty Ltd	Barry, KM; Wilson, CR	Biopesticides in horticulture: efficacy of <i>Trichoderma harzianum</i> to control <i>Botrytis cinerea</i> in horticultural crops
Horticulture Innovation Australia	Apple & Pear Growers Association of South Australia ; Department of Primary Industries and Regional Development, Western Australia; Department of Primary Industries NSW	Swarts, ND; Bound, SA; Close, DC; Buntain, M; Hardie, MA; Glen, M	Improved Australian apple and pear orchards soil health and plant nutrition
Martha Jane Medical		Garland, SM; Close, DC; Menary, RC	Understanding and manipulating environmental factors for targeted cannabinoid production
Scion New Zealand Forest Research Institute Limited		Allen, GR; Quarrell, SR	Host relationships of the proposed biocontrol agent for New Zealand, <i>Eadya paropsidis</i>
Simplot Australia		Wilson, CR; Wilson, A; Tegg, RS	Germinate to Exterminate - Simplot
W & E Health Pty Ltd		Close, DC; Boersma, M; Garland, SM	Research Hub for Traditional Chinese Herbs
Wine Australia	Australian Wine Research Institute; Smith-Hill Family Vineyards; University of Adelaide	Kerslake, FL; Close, DC; Damberg, R; Merry, AM; Wilkinson, K; Smith, P; Goemann, K; Rodemann, T; Longo, R; Carew, ALJ; Sawyer, S; Latham, R	Building and measuring the quality of fine Australian sparkling wines, through identification of the impact compounds responsible for autolytic character in sparkling wine, and novel winemaking tech

FUNDING BODY	INDUSTRY PARTNERS	RESEARCH TEAM	TITLE OF PROJECT
Wine Australia		Jones, JE; Swarts, ND; Kerslake, FL	Improving grapevine quality and yield through improved vine nutrition and pruning
Wine Australia		Swarts, ND; Jones, JE	Science to inform decision making between synthetic and alternative nitrogen sources in vineyards: Top-up scholarship and operating
Department of Primary Industries, Parks, Water & Environment		Rose, M	Research & Development Contractual Agreement - TIA JVA
LEARNING AND TEACHING			
Australian Council of Deans of Science		Acuna, TL; Kelder, JC; Jones, S; Phegan, R	Distributed leadership to embed scholarship in STEM teaching teams
LIVESTOCK PRODUCTION			
Australian Wool Innovation Limited		Horton, BJ; Verdon, MJ; Andrewartha, SJ; Kang, BH; Cao, Z; Chinthammit, W; Bailey, AN	Tasmanian Wool SmartFarm
CRC for High Performance Soils Ltd		Horton, BJ; Harrison, MT	Improving the representation of soil productivity/ constraints in existing decision support systems and modelling platforms
Dairy Australia Limited		Hills, JL; Langworthy, A; Raedts, PJM; Gee, CM; McLaren, D; Verdon, MJ; Snare, TA; Millhouse, BJ	Dairy High 2
Dairy Australia Limited		Rawnsley, RP; Hills, JL; Raedts, PJM; Irvine, LD; Turner, LR; Langworthy, A; Jones, S; Flight, S; Gee, CM; Verdon, MJ; Snare, RD; Hall, AF (AI); Cuin, TA (AI); McLaren, D (AI)	Dairy HIGH - High Integrity Grass-fed Herds
Department of Agriculture	University of Melbourne	Rawnsley, RP; Christie, KM; Harrison, MT; Eckard, R	More Profit from Nitrogen: enhancing the nutrient use efficiency of intensive cropping and pasture systems
Department of Agriculture	Agersens Pty Ltd; Australian Pork Limited; Australian Wool Innovation Limited; CSIRO-Commonwealth Scientific & Industrial Research Organisation; Dairy Australia Limited; Meat and Livestock Australia; University of Melbourne; University of New England; University of Sydney	Tomkins, N; Swan, P; D'Souza, D; Henry, D; Rawnsley, RP; Hills, JL; Freeman, MJ; Verdon, MJ; Langworthy, A	Enhancing the profitability and productivity of livestock farming through virtual herding technology
Department of Agriculture and Water Resources	Cotton Research and Development Corporation	Hills, JL; McLaren, D; Flight, S; Rawnsley, RP; Jones, S; Hardie, MA; Langworthy, A	Smarter Irrigation for Profit - Phase 2
University of New England		Verdon, MJ	A national framework for effective environmental enrichment for Australian livestock industries

This list reflects only the information available at the time of publishing. It does not include the many industry partners and growers who also make our research possible. We are thankful to all of our contributors.

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Ara, I and Harrison, MT and Whitehead, J* and Waldner, F* and Bridle, K and Gilfedder, L and da Silva, JM* and Marques, F* and Rawnsley, R, "Modelling seasonal pasture growth and botanical composition at the paddock scale with satellite imagery", In Silico Plants Article diaa013. ISSN 2517-5025 (2020) [Refereed Article]

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Ara, I and Harrison, MT, National Landcare Programme Phase 2: Progress Report 5 - Remote sensing informed sheep grazing of introduced pastures and integrated management to assist Lowland Themeda grassland and woodland regeneration in Tasmania, Department of Agriculture and Water Resources, Hobart, Australia (2020) [Contract Report]

Ara, I and Harrison, MT, Remote sensing informed sheep grazing of introduced pastures and integrated management to assist Lowland Themeda grassland and woodland regeneration in Tasmania, National Landcare Programme Phase 2, Australia, 3 (2020) [Contract Report]

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