ABOUT TIA

The Tasmanian Institute of Agriculture (TIA) is a research institute at the University of Tasmania specialising in impact-driven research to support prosperous, innovative and sustainable agriculture and food sectors, and a healthy bioeconomy.

TIA began in 1996 as a joint venture between the University of Tasmania and the Tasmanian Government, bringing together the human and physical resources of the Tasmanian Government with the scientific, research and teaching capacity of the University of Tasmania.

Over the past 20+ years, TIA has gained national and international recognition and has delivered hundreds of successful projects with global relevance and direct impact for Tasmania’s vibrant agriculture and food sectors.

TIA has access to world-class equipment and facilities around Tasmania, and its location in this remarkable and pristine environment enables researchers to explore key questions about sustainable resource management and productive landscapes.

TIA is also home to the University's agricultural teaching discipline, with responsibility for undergraduate education and the training of postgraduate candidates who make an important contribution to TIA’s research.

Close relationships across the agriculture and food value chain at a local, national and international level ensure TIA is connected with stakeholders and that research and education priorities support industry needs and aspirations.

TIA’s capacity to develop flexible industry-facing solutions is a point of difference in the academic sector that it works within.

TIA plays an integral role in guiding the future economic and environmental sustainability of agriculture and food sectors.

$70 MILLION

In 2017, the total value of TIA’s research portfolio was approximately $70 million.

130+

Dynamic team of 130+ scientists and technical experts, many of whom are internationally renowned.

CONNECTIONS

Strong connections to other research, development, extension and education institutions in Australia and around the world.
MESSAGE FROM THE DIRECTOR

We are continuing to develop new partnerships and strategies to ensure Tasmania is at the forefront of global agriculture and food research initiatives.

During 2017, this included the signing of a new agreement with the Chinese Academy of Agricultural Sciences (CAAS), the preeminent agricultural sciences organisation in the world’s largest agricultural nation.

We will develop joint research proposals under the general themes of soils, water, pollination, horticulture, and food science – all areas of specific TIA expertise. Collaboration with CAAS will contribute towards solving global challenges as well as tangible benefits for farmers here in Tasmania.

Looking ahead to 2018, TIA will be recognised in the new university structure as research institute within the new College of Sciences and Engineering at the University of Tasmania.

This will provide a constructive platform for future development and growth, including an opportunity to extend our research and impact internationally, foster new partnerships and enhance our contribution to the growth and competitiveness of Tasmania’s agriculture and food sectors. TIA will be an Institute with global reach and local relevance.

2017 highlights

- Launching a major social research initiative the ‘Aspirations for Food and Agriculture’ (TasAgFuture) project, to help define the future direction of our research
- Securing leading roles with two national Co-Operative Research Centres – iMove CRC and the CRC for High Performance Soils
- A broad range of new and ongoing research to support Tasmania’s agriculture sectors, with a research portfolio worth $70 million
- Kicking-off the first year of the Masterclass in Horticultural Business, providing professional development for Australia’s horticulture sector, which has proven remarkably popular and successful
- Working closely with Tasmanian farmers through the Water for Profit program to enhance their returns and sustainability from investment in irrigation
- Working collaboratively with our joint venture partner, the Tasmanian Government, to develop the White Paper: Growing Tasmanian Agriculture RD&E for 2050
- Being recognised as 44th in the world and 4th in Australia for agricultural sciences (AWRU), an acknowledgement of our high quality of research and teaching
- Realigning TIA’s internal structure to enhance our research impact by bring together staff expertise, enhancing collaboration (internal and external), and increase our agility to respond to sector priorities.

I would like to thank our stakeholders for their ongoing support. On behalf of all of us at TIA, we look forward to continuing to work closely with our partners in industry, community, research, education and government to support Tasmania’s agriculture and food sectors.

Professor Holger Meinke, Director of TIA
TIA MANAGEMENT TEAM

TIA’s Management Team is a decision-making body with responsibility for strategy, governance and risk matters and facilitating inter and intra collaboration between TIA and University disciplines.

Professor Holger Meinke
Director

Mr James Stronach
Deputy Director (Strategy & Engagement)

Associate Professor Dugald Close
Associate Head (Research)

Dr Fiona Kerslake
Centre Leader for Horticulture

Dr Richard Rawnsley
Centre Leader for Dairy, Grains and Grazing

Professor Caroline Mohammed
Centre Leader for Agricultural Systems

Associate Professor John Bowman
Centre Leader for Food Safety and Innovation

Dr Kathy Evans
Strategic Projects Portfolio Lead

2017 HIGHLIGHTS
Tasmanian Institute of Agriculture
This has been an important and productive year for the Advisory Board and TIA. Over the last 12 months a major focus has been undertaking the groundwork for an exciting time for the Institute and its future direction.

Key to this has been the wide-ranging review of agricultural research, development and extension. I noted in the 2016 Board Report that this review was planned, with the intent of completing a White Paper on agricultural RD&E - Growing Tasmanian Agriculture – Research, Development and Extension for 2050.

I am pleased to report that, following a major process of collaboration between TIA and DPIPWE, this was achieved in November 2017. The dominant theme of the White Paper was the centrality of ensuring that TIA’s research excellence is harnessed to deliver practical outcomes that enhance productivity and promote innovation, competitiveness and sustainability in Tasmania’s agriculture and food industries.

During 2017 the Board oversaw some major collaborative projects that deliver the practical outcomes the White Paper is encouraging. Notable examples include the work on systemic downy mildew in poppies, which had emerged unexpectedly as a major issue in 2016; the study of bio-fumigation in vegetable production in Tasmanian conditions; and the project to mitigate the variability in wine grape yields. These, and many others that are featured in this report, directly address practical problems and challenges faced by our agricultural industries – and critically, help keep them competitive.

In achieving these goals, I want to acknowledge the work of TIA staff as well as fellow members of the Advisory Board. The Board is central to TIA’s governance structure and its inclusion of industry reinforces the three-way partnership of industry, Government and University that underlies TIA’s ongoing success and recognition. It is also worth acknowledging the four new industry members appointed in June 2016, who’ve brought a broad range of experiences and skills as well as refreshing energy and commitment.

I look forward to continuing to work closely with the Board as we implement these measures, which will ensure TIA remains at the forefront of agricultural research, in partnership with industry and government.

Dr John Whittington (Chair)
Secretary, DPIPWE Tasmania
Institute of Agriculture
TIA receives strategic advice from an Advisory Board that consists of 12 representatives from the University of Tasmania, Tasmanian Government, and the State’s agriculture and food sectors.

‘TIA’s capacity to develop flexible industry-facing solutions is a point of difference in the academic sector that it works within.’

Professor Brigid Heywood
Deputy Vice-Chancellor (Research)

Professor Brian Yates
Dean of the College of Sciences and Engineering

University of Tasmania representatives

Professor Holger Meinke
TIA Director

Tasmanian Government representatives

Dr John Whittington
(Chair)
Secretary of DPIPWE

Mr Mark Sayer
Deputy Secretary
AgriGrowth Tasmania, DPIPWE

Ms Carole Rodger
Director of AgriGrowth Tasmania, DPIPWE

Industry representatives

Dr Davina Gregory-Dunsmuir
Dr Hazel MacTavish-West

Mr Marcus Griffin
Ms Mel Rae
SUPERSTAR OF STEM

TIA’s Dr Fiona Kerslake is recognised as one of Australia’s most dynamic and inspiring female scientists.

Dr Kerslake was one of 30 Australian women selected to join Science and Technology Australia’s Superstars of STEM program in 2017. The program aims to develop science role models for young women, which Dr Kerslake says is particularly important for agriculture.

“Meeting all these amazing women in completely diverse fields from what I’m doing [through Superstars of STEM] has been very valuable. I’m grateful for being in the field I’m in and I’ve had a very supportive manager, who has been incredibly supportive of me taking risks in my position and creating an enabling environment,” Dr Kerslake.
MESSAGE FROM THE MINISTER

Through the Tasmanian Institute of Agriculture (TIA), a joint venture between the State Government and the University of Tasmania, the Tasmanian Government is working closely with farmers, researchers and agribusiness to set an exciting new direction for advancing agricultural research in Tasmania.

The White Paper: Growing Tasmanian Agriculture – Research, Development and Extension for 2050 was launched in 2017. This provides the road-map for driving productivity, delivering greater returns for farmers, and outlines more industry relevant research and partnerships with the private sector, to meet our target to grow the value of the State’s agricultural sector tenfold to $10 billion per annum by 2050.

The White Paper confirms that TIA remains our preferred provider of publicly-funded agricultural research, development and extension (RD&E) services.

In addition to our significant annual investment, the Tasmanian Government’s support for TIA in 2017 also included funding for specific research initiatives with a focus on maximising farmers’ returns from investment in irrigation, increasing update of precision agriculture technologies, enhanced crop production and soil health, and improving the yield of Tasmanian vineyards.

TIA is unique within Australia and is the envy of many other jurisdictions. With its statewide focus and connectivity with the broader University of Tasmania community, TIA offers our agricultural sector unparalleled opportunities for meaningful engagement with the RD&E system, to support adoption of the best available technologies and practices on-farm.

I would like to express my appreciation to Professor Holger Meinke, TIA Director, and the team of researchers, technical and professional staff at TIA for their commitment to supporting prosperous, innovative and sustainable agriculture industries in Tasmania.

The Hon. Guy Barnett MP  
Minister for Primary Industries and Water
Working closely with established and emerging industries, with a focus on quality and productivity in fruit and tree crops, grapes and wine, berries, industrial and extractive crops, and vegetables.
IMPROVING SOIL HEALTH
FUNDING: Hort Innovation

We are working to enhance the productivity and sustainability of the nation's potato industry through a focus on soil health.

The one-year project will provide benefits to potato industry levy payers around Australia through the development of extension materials and identification of priorities for future research, development and extension (RD&E).

As part of the project, an Industry Forum was held at the TIA Vegetable Research Facility at Forthside to share information with people working in the potato industry.

This included presentations from international experts Dr Bob Larkin from the United States Department of Agriculture and Professor Richard Falloon from the New Zealand Institute for Plant and Food Research.

“There is a wealth of knowledge available on the topic of soil health. We want to help potato growers to increase their productivity by providing them with knowledge of what constitutes healthy and productive soils and where the current best practices are for improving soil health,” TIA Research Fellow Dr Robert Tegg.

INCREASING YIELD OF PROCESSING CROPS
FUNDING: Hort Innovation, with in-kind contributions Simplot and Applied Horticultural Research

Improving the production practices for processing crops such as broccoli, cauliflower, carrots, green beans and sweetcorn is the focus of a new project commenced during 2017.

The project aims to support the future viability of Australia's vegetable processing industry by identifying potential areas of productivity gains, to help it remain competitive on a global scale.

“Tasmania's production of key crops for the frozen processing market had a farm gate value of $22.6 million in 2014/15. These products compete in a global market, which makes it vital that our growers are using world best practice to grow and harvest their crops,” TIA Industry Development Manager Ms Sue Hinton.
HORTICULTURE CENTRE HIGHLIGHTS

PRECISION PEAS
YIELD RESULTS
FUNDING: Hort Innovation, Simplot

Our researchers have found a way to significantly increase the yield of green pea crops through precision planting techniques, with the potential for tangible benefits for growers and long-term sustainability for the Australian vegetable processing industry.

The aim is to increase the yield of green peas, by 33 per cent, from 6 tonnes per hectare to eight tonnes per hectare by 2020.

“Green pea crops planted exactly 10 centimetres apart have a much greater yield than those with different spatial arrangements. This optimal spacing can result in yields of up to 15 per cent more and an increase in margins by up to $750 per hectare,” TIA Senior Lecturer in Horticultural Science Dr Alistair Gracie.

MONITORING FOR PESTS
FUNDING: Hort Innovation

The surveillance program for tomato potato psyllid (TPP) intensified during 2017, with double the number of traps positioned around Tasmania as part of a TIA-led monitoring program.

“TPP poses a serious threat to a number of crops including potato, tomato, capsicum, eggplant and chilli. After the pest was discovered in Western Australia in early 2017 our surveillance program has intensified and the interest from industry stakeholders is growing,” TIA Trapping Program Coordinator Ms Raylea Rowbottom.

“Early detection of TPP is absolutely vital to ensure that we can implement an effective containment and eradication strategy if the pest does arrive in Tasmania. We have had an outstanding response from industry.”
SUPPORTING EMERGING HEMP INDUSTRY

FUNDING: Ecofibre Industries

Tasmanian farmers have shown strong interest in industrial hemp, with more than 100 people attending TIA’s first Industrial Hemp Field Day held at the TIA Vegetable Research Facility at Forthside, in February.

The event showcased a new research collaboration with Ecofibre Industries that aims to produce high yielding, low-THC industrial hemp varieties suited to Tasmania’s climate.

“We already know that Tasmania’s long, cool growing season has benefits for other crops such as potatoes and we are interested to study the adaption of low-THC industrial hemp varieties to Tasmania’s climate,”

TIA Research Fellow, Dr Mark Boersma.

MANAGING SYSTEMIC DOWNY MILDEW

FUNDING: Australian Research Council

Research Fellow Dr Jason Scott was successful in receiving a Linkage Grant from the Australian Research Council for a project worth $1.6 million to continue successful research to support the poppy industry.

The research team, led by Dr Scott, is developing a tool to help growers manage the spread of the disease in a more informed way, something vital to the future competitiveness of the sector.

The project is a collaboration with industry bodies, companies and government to better understand the spread of systemic downy mildew in the Australian poppy crop.
BEATING FUNGICIDE RESISTANCE
Funding: Australian Research Council, Botanical Resources Australia

The Australian pyrethrum industry produces the majority of the world’s supply of the natural insecticides, pyrethrins. That much of it comes from Tasmania is testament to the strong success of TIA’s long-term research pest and disease management.

Commercial pyrethrum production is limited by a range of fungal pathogens, some of which have evolved significant resistance to the SDHI fungicides used to control them. Dr Tamieka Pearce has developed a novel genotyping technique to unravel the genetics of the fungi and understand the evolution of their resistance.

This will enable growers to target fungal strains with the right fungicide, and avoid wasting money on ineffective treatments that increase resistance. Moreover, her work is highly relevant to many other crops that use SDHI fungicides, such as grains, nuts, apples, and grapes.

SPARKLING SCIENCE BOOSTS WINE QUALITY

FUNDING: Wine Australia, Hill-Smith Family Vineyards, Josef Chromy Wines, Apogee Tasmania, Australian Wine Research Institute

Dr Fiona Kerslake uncorked a batch of sparkling wines she produced six years earlier, to analyse the compounds associated with texture, mouth feel, flavour and aroma.

It was a crucial step in a research project that commenced with vineyard trials looking at the impact that specific viticultural practices such as leaf removal, crop load and pruning techniques have on the characteristics of sparkling wine.

Seeking objective measures of sparkling wine quality, she wants to identify which treatment is responsible for creating each premium characteristic. The results are intended to help wine producers manage their vines to produce the fruit needed to create a particular style of sparkling wine.

The next phase of this project is to investigate technologies to reduce the length of the process of ageing premium sparkling wines, enabling wine producers to get their products sooner, while maintaining or improving quality.

The project was initially funded by AusIndustry and a consortium of Tasmanian wine producers.
SOLVING BLACKBERRY REVERSION MYSTERY

FUNDING: Blackberries Australia, Costa Group

PhD Candidate Max Edgley is investigating a challenging issue known as blackberry red drupelet disorder or ‘reversion’ where individual blackberry segments or drupes revert from black to red after the fruit is harvested.

This can affect up to one third of a crop which means its impact on this expanding industry could be significant if left untreated.

His first breakthrough came with a fertigation trial, demonstrating that high rates of nitrogen fertiliser can exacerbate reversion disorder. Temperature and humidity changes during harvest and packing are also proving to be key factors, with rapid cooling of fruit causing rapid swelling and shrinking of the cell wall which can lead to more red drupelets.

REDBERRY MITE

FUNDING: Hort Innovation

In December, we started a three-year project to identify effective integrated pest management tools and strategies for redberry mite. We received a fantastic response after reaching out to blackberry growers around Australia to participate in this project.

Redberry mite is a microscopic pest that causes uneven ripening of blackberry fruit, typically creating a berry that is half-black and half-red.

The pest poses a significant challenge for Australia’s blackberry industry, as damaged fruit is unattractive to consumers, leading to lower marketable yields.

“Commercial blackberry production in Australia is expanding rapidly and we want to support the industry’s ongoing productivity and sustainability,” TIA Entomologist Dr Stephen Quarrell.
LARGER, TASTIER CHERRIES

FUNDING: Department of Agriculture and Water Resources, Hort Innovation, Cherry Growers Australia

Working closely with the state’s cherry industry, we are striving to enhance productivity and fruit quality through a focus on nitrogen application in orchards.

“The project is strongly supported by industry, with four trials being established in commercial cherry orchards in southern Tasmania. The trials will examine different timing of nitrogen fertiliser application, distribution of nitrogen within the tree organs, fruit yield and quality, and nitrogen losses to the environment.

The results will be shared with industry.”

TIA Research Fellow Nigel Swarts.

COLLABORATIVE PROJECT TO BENEFIT APPLE EXPORTERS

FUNDING: Australian Department of Agriculture and Water Resources Package Assisting Small Exporters grant

In collaboration with Fruit Growers Tasmania, we are developing a post-harvest guide for apple producers and an informative manual about exporting apples.

The resources (to be launched in 2018) will be freely accessible to apple producers around Australia, providing a step-by-step reference guide to exporting apples to both protocol and non-protocol countries. The project is led by Bob Nissen and Sally Bound.
TIA Senior Research Fellow Dr Matthew Harrison was named 2017 Young Agronomist of the Year in recognition of his contribution to industry-relevant research, including development of an online tool to help farmers predict pasture growth.

The award, presented at the 18th Australian Agronomy Conference in Ballarat, recognises an agronomist aged 36 or under for their record of publications, supervision of PhD candidates, research funding, service to the industry and research impact.

“Over the past five years at TIA, I have worked on systems modelling research across several fields including crop genetics, climate science, soil microbiology, plant physiology and livestock production,” Dr Harrison.
Enhancing innovation, productivity and sustainability for livestock industries.
A FENCE-FREE FUTURE?

FUNDING: The Virtual Herding project is supported by funding from the Federal Government’s Department of Agriculture and Water Resources as part of its Rural Research and Development for Profit program. It is a partnership between CSIRO, the University of Sydney, University of New England, the Tasmanian Institute of Agriculture, the University of Melbourne and Agersens Pty Ltd, with further funding support from the dairy, beef, wool and pork industries and their respective RDCs; Dairy Australia, Meat and Livestock Australia, Australian Wool Innovation and Australian Pork Limited.

The virtual herding project was established to assess the potential of virtual herding technology across the major livestock industries in Australia. In particular, it is looking at the opportunities to enable more efficient use of pasture, protect environmentally sensitive areas, improve the performance of livestock by matching their nutritional needs to feed availability, and reduce on-farm labour. It aims to support significant productivity and profitability gains for Australian farmers.

We are leading a subprogram looking at using virtual herding technology to improve pasture utilisation for the dairy industry. Our research team, led by Dr Megan Verdon, is conducting experiments at the TIA Dairy Research Facility at Elliott in North-West Tasmania.

“Once we know how animals respond and interact with the technology we can then explore how it can sustainably be used to increase dairy farm productivity through more tightly controlled stock movement,” Dr Megan Verdon.

NEW FORAGE RESEARCH

FUNDING: Dairy Australia

New research is looking at how dairy farmers can best incorporate plantain (a forage herb) into traditional ryegrass pastures, to boost production and profitability.

Four Tasmanian dairy farming businesses are participating in the on-farm trials and approximately 4.5 hectares has been set-aside at each site to conduct the experiment.

A trial site is also being established at TIA’s Dairy Research Facility at Elliott and the project is being led by TIA Research Fellow Pieter Readts and PhD Candidate Adam Langworthy.

“TIA has previously undertaken research that found the inclusion of plantain, a forage herb, in ryegrass paddocks can boost cow pasture consumption rates and increase milk solid production. We are continuing this by looking at how farmers can effectively incorporate plantain into their current grazing practices.” TIA PhD candidate Adam Langworthy.
ACCELERATED CALF REARING:
FUNDING: DairyTas

A trial at the TIA Dairy Research Facility is investigating the long-term benefits of reducing the number of days it takes dairy calves to reach weaning weight. The project aims to improve the productivity of Tasmania’s dairy industry by finding the most cost effective way of rearing calves that will result in the best lifetime milk production.

“We found that calves with unlimited access to milk performed the best, taking an average of 42 days to double their birth weight and 80 days to achieve weaning weight (90kg for crossbreeds and 100kg for Friesians),” TIA Dairy Researcher Mark Freeman.

“In comparison, the control group given four litres of milk per day took 56 days to double their birth weight and 90 days to reach weaning weight.

“Being able to wean calves faster could potentially provide dairy farmers with significant economic benefits, saving them 10 days’ worth of labour costs.”

TASMANIAN DAIRY BUSINESS OF THE YEAR
FUNDING: The benchmarking program is funded by Dairy Australia. The Awards are jointly presented by TIA and Dairy Tas.

Our Dairy Extension Team run a free benchmarking program to measure financial and physical information of Tasmanian dairy farms, including costs (per cow, per hectare and per kilogram of milk solids), milk and feed production, labour efficiency and pasture utilisation.

The Tasmanian Dairy Business of the Year is awarded to the business that records the best overall results in the program, and in 2017 was awarded to Gerard and Ria Mulder from Forest. The Mulders are members of the TIA North West Dairy Discussion Group and participate in benchmarking to monitor their farm and make changes to improve productivity and profitability.

“The feedback we’ve received shows the dairy business benchmarking program is a great way of helping dairy businesses make confident and effective farm management decisions that will benefit them into the future,” TIA Dairy Extension Leader, Lesley Irvine.
DAIRY, GRAINS AND GRAZING CENTRE HIGHLIGHTS

SMARTER IRRIGATION FOR PROFIT

FUNDING: The Smarter Irrigation for Profit project is supported by funding from the Federal Government’s Department of Agriculture and Water Resources as part of its Rural Research and Development for Profit program, Dairy Australia and TIA.

The national Smarter Irrigation for Profit project aims to improve the profitability of agricultural industries, including dairy, through improvement in water use efficiency. The Tasmanian trials, led by TIA Research Fellow Dr James Hills, are using sensor technology to collect data on power usage, water use, soil moisture and weather at five pivot-irrigated pasture sites in North and North-West Tasmania.

The Green Drought

New research has revealed that ‘the green drought’ can cause pasture growth rates to decrease by 50 per cent during contrasting seasons, despite irrigation water being applied.

A ‘green drought’ occurs when poor irrigation scheduling leads to deficits and the application of irrigation water keeps the grass green, but doesn’t result in optimum pasture growth rates.

Significant savings

Using variable rate irrigation (VRI) could reduce water use by as much as 30 per cent, creating significant savings for farmers. This discovery was made through trials conducted on five pivot-irrigated pasture sites on dairy farms in North and North-West Tasmania.

“It is a huge cost and something that can be avoided if farmers make sure the irrigation start-up time is right at the beginning of the season, before the soil profile dries out too much,” Dr James Hills.

“By installing a VRI on our trial site at Montana we saw a 29 per cent reduction in water use. On a pivot of 55Ha this could potentially save up to 70ML over the irrigation season that could be used elsewhere on the farm to increase productivity,” Dr James Hills.

“For this particular site this translated to around a $5,300 saving in energy and water and some of our other sites have shown even higher potential savings of up to nearly $12,000 per year.”
REWILDING PLANTS FOR GLOBAL FOOD SECURITY

FUNDING: Australian Research Council

Professor Sergey Shabala and his team are tackling a key challenge to human survival - within a few decades, current agricultural practices will no longer be sufficient to support global food security. His solution is to boost productivity by ‘rewilding’ crop plants to make them more resilient. Natural defences of our crops against floods, drought or salinity could be restored by reintroducing wild traits lost through their domestication.

In 2017, his team published a high-quality assembly of the quinoa genome, along with identifying the genes responsible and the molecular mechanism for quinoa’s high salt tolerance. These world-leading innovations are the foundation for further work to transfer quinoa ‘superpowers’ into other traditional cash crops.

INCREASING GRAIN YIELDS

FUNDING: Grains Research and Development Corporation (GRDC)

TIA Research Fellows, Dr Angela Merry and Associate Professor Tina Acuña, are leading the Tasmanian component of a national project to increase the yield of grains in high rainfall zones.

During 2017 they analysed results from a trial that specifically looked at how a plant’s leaf architecture contributes to yield. The findings went against their assumption that lines with more erect leaves would intercept more solar radiation which would translate into increased grain yield.

“We actually found that plants with more prostrate leaves produced a higher yield than plants with a more erect leaf. This contrasted with mainland sites where the opposite trend was observed. Our results indicate there is a potential interaction between sites and lines for leaf type,” Dr Angela Merry.
EAST COAST PASTURES

We are teaming-up with Natural Resource Management (NRM) South to invest in a new pasture project to help improve the productivity and sustainability of pasture systems in Tasmania.

Led by TIA Research Fellow, Dr Rowan Smith, the project aims to identify a perennial legume that persists in the dryland wool grazing environment of the East Coast of Tasmania.

“We saw this gap in the system as an opportunity to undertake further research to make a positive impact for local producers. Legumes are a high quality source of animal feed and can lead to increased overall pasture productivity,” Dr Rowan Smith.

PRESERVING PASTURES FOR FUTURE

FUNDING: Grains Research and Development Corporation (GRDC)

TIA leads the temperate grasses regeneration program for the Australian Pastures Genebank, which is Australia’s first national pasture and forage genetic resource centre.

We have a dedicated plot at the Cressy Research Station and each year we provide approximately three million seeds as part of this program.

“Continued development and access of pasture species suitable to Tasmania’s climate and grazing systems is vital and the work we are doing in Tasmania is supporting the long-term availability of diverse pasture species for farmers,” Dr Rowan Smith.
Helping to make sense of complex interactions within agricultural and food systems, a topic that is increasingly important for prosperous management of our natural resources into the future.
AGRICULTURAL SYSTEMS CENTRE HIGHLIGHTS

TASAGFUTURE
FUNDING: TIA

On National Agriculture Day (21 November 2017), we launched a major social research initiative – the TasAgFuture project.

Led by Senior Research Fellow Dr Peat Leith, the project aims to identify the drivers of change for Tasmanian food producers and processors and the changing needs for research, development and engagement.

Our research team are having in-depth conversations with industry, government and the broader community about where Tasmania’s food and agriculture sectors are heading and how we will get there.

In 2018, we will launch an online survey to capture even more diverse views which will help to inform the future direction for TIA’s research strategy.

The findings will help us align our research to ensure Tasmania’s agriculture and food sectors are vibrant, productive and sustainable.

IMPROVING SOILS FOR HIGH PERFORMANCE
FUNDING: Federal Department of Industry, Innovation and Science

Our strengths in agricultural science and big data have led to a key role in the new national Cooperative Research Centre for High Performance Soils.

Plant pathologist Caroline Mohammed, the first female professor of agricultural science at the University of Tasmania and a specialist in interdisciplinary research, is part of the CRC for High Performance Soils team.

The CRC has been established to provide farmers with the knowledge and tools they need to make decisions on extremely complex soil management issues. Over the next decade, it will focus on increasing the value and quality of the crops produced without necessarily increasing the amount of land under management, by bridging the gap between soil science and farm management.
NEW SOILS LAB

During 2017, we established a new soil physics laboratory at our Sandy Bay campus with state-of-the-art technology to analyse soil from research sites across the State. This lab has enabled researchers to analyse samples in detail within a week compared to three months with previous technology.

The new equipment means researchers can measure soil water retention curves, field capacity, soil structure and determine parameters for soil water modelling.

“The soil laboratory is the first of its kind at TIA and is contributing towards the success of the Water for Profit program. Information from TIA’s soil research will be used by farmers to make informed decisions to improve the health and productivity of their soils, crops and irrigation,” TIA Irrigation Program Leader, Sue Hinton.

WATER FOR PROFIT

FUNDING: A collaborative program between the Department of Primary Industries, Parks, Water and Environment (DPIPWE), the Tasmanian Institute of Agriculture (TIA), and the Tasmanian Farmers and Graziers Association (TFGA).

Now in its third year, the Water for Profit program is ensuring farmers are equipped with the best information to increase their profits and sustainability from their investment in water.

In May 2017, more than 100 people attended a free public event at Longford where they received practical and relevant information from TIA researchers, national researchers and local growers.

“We have formed grower groups across Tasmania and more than 50 farming businesses regularly engage with the program through these platforms. This participatory approach is an essential part of the program, and ensures we are helping farmers get the right skills and information to maximise their investment in irrigation,” TIA Irrigation Program Leader, Sue Hinton.
“It’s always good working with a progressive group of farmers – you always learn something from one another. Hopefully as a group we can do something that is positive for the whole of the Tasmanian irrigation industry.”

David Whishaw, Carrick

“It’s always good working with a progressive group of farmers – you always learn something from one another. Hopefully as a group we can do something that is positive for the whole of the Tasmanian irrigation industry.”

David Whishaw, Carrick

“It’s good to be talking about the issues and getting the best out of your systems.”

Chris Bayles, Cressy

“The farmer groups are valuable. Water is expensive and we need to utilise that resource as best as we can.”

Greg Gibson, Hagley

Here’s what the participants say:
FOOD SAFETY AND INNOVATION CENTRE HIGHLIGHTS

Providing industry and government with access to cutting-edge research and knowledge of emerging issues related to food safety, shelf life, and innovations in food quality and processing.
ONLINE TOOL FOR RAW MILK CHEESE

FUNDING: Dairy Food Safety Victoria, Food Standards Australia New Zealand and New South Wales Food Authority

Associate Professor Tom Ross and his co-researchers have developed a new decision support tool to enable raw milk cheese makers to comply with food safety regulations.

The ‘Raw Milk Cheese Assessment’ software enables producers to easily evaluate all stages of the cheese making process to ensure a safe final product. The tool asks the user a series of questions and then automatically performs calculations based on FSANZ regulations.

“Food safety is essential to industry sustainability and we need to be confident that raw-milk cheese is not going to cause food-borne illnesses from contamination with pathogenic bacteria,” Assoc. Prof. Tom Ross.

PREDICTIVE MICROBIOLOGY FOR MEAT EXPORTS

FUNDING: Meat and Livestock Australia; Australian Meat Processor Corporation

Our food safety research is helping to strengthen Australia’s international reputation for exporting premium quality lamb and beef.

Dr Mandeep Kaur investigated how time, temperature, microbiology and biochemistry of meat affects its shelf life, especially for vacuum-packed chilled beef. A computer model was developed that applies shipping temperature records to estimate remaining shelf life. Using several international supply chains as an example, the temperatures that red meat is exposed to during the transportation process were tested. The research found that it was possible to extend the shelf-life limit for Australian vacuum-packed chilled beef to 140 days. This would nearly double the current shelf-life for exports to Japan, offering greater flexibility to growers and processors.
BLOG FOR RED MEAT INDUSTRY

During 2017 we launched a blog (Meaty Micro Matters) to provide Australia's red meat industry with leading information to enhance their capacity to innovatively respond to microbiological issues and related market threats.

The blog provides regular updates on research projects including antimicrobial interventions and shelf life extension.

TIA is a Principal Research Organisation for Microbial Ecology and Physiology (PROMEP), and this research is jointly-administered and funded by Meat and Livestock Australia (MLA) with financial support from the Australian Meat Processor Corporation (AMPC).

FOOD SAFE LAB

A new food safe laboratory was opened at our Sandy Bay campus during 2017, expanding the ability of agricultural researchers to assess taste and texture in the lab.

Researchers have previously been able to measure colour, texture, the visual appeal of food and aroma. Now they can also assess taste and texture, something that isn't possible in other laboratories due to chemical and biological hazards.

It will also be used for student and teacher outreach activities to showcase the importance of the science of agriculture and food.
ARC TRAINING CENTRE FOR INNOVATIVE HORTICULTURAL PRODUCTS

FUNDING: The ARC Training Centre for Innovative Horticultural Products is funded by the Australian Research Council (ARC), Woolworths and the University of Tasmania.

The Centre’s 10 PhD students are working collaboratively with industry to analyse the market and develop science and technology that will give fruit and vegetable products improved shelf life and quality.

Longer lasting baby spinach

PhD candidate Vongai Dakwa is working with Houston’s Farm to increase the shelf life of baby spinach and other baby salad leaves to enhance consumer experience and reduce product waste that occurs in the supply chain and during retail storage.

Green potatoes

PhD candidate Sabine Tanios is collaborating with Daly Gourmet Potatoes, Zerella Fresh and Woolworths to find ways to reduce greening of potatoes.

The research involves investigating the type of light that causes greening, the impact of nitrogen fertilisation on greening levels and greening susceptibility for different potato varieties and maturity levels.

“As part of this project we screened 105 varieties of potatoes, and there's big differences between them. What we are trying to do is understand why that is, so we found components – a lipid – in the skins which can act as a barrier and reduces light penetration, which reduces greening,” Sabine Tanios.

Bumpy road to perfect fruit

FUNDING: Project is a collaboration with the Australian Maritime College.

PhD candidate Indika Fernando simulated the 96 hour truck journey (and all the bumping and shaking around) when transporting bananas from the plantation to the store. In these experiments, he used nearly 4000kg of bananas generously provided by Costa.

The research is a first-in-the-world attempt to understand vibration characteristics of road trains and the variations in damage caused to produce from vibration along the trailer bed. The findings will be directly applicable and useful for simulations on any produce in transit across Australia.

“Baby leafy salad vegetables have a high respiration rate and short shelf life of about 12 days and I’m working with Houston’s Farm to increase this and meet consumer demand, while retaining quality and food safety,” Vongai Dakwa.
GLOBAL HIGHLIGHTS

NEW ERA OF AGRICULTURAL RESEARCH COOPERATION BETWEEN TASMANIA AND CHINA

A series of agreements were signed in November 2017, formalising the relationship between the University of Tasmania, NRM South, and the Chinese Academy of Agricultural Sciences (CAAS).

CAAS is the pre-eminent agricultural sciences organisation in China and has oversight of 42 research institutions, with over 5000 professional staff and a graduate school of 4300 students.

The MOU with CAAS allows for future joint research activities, joint scholarly and teaching activities, staff and student exchanges, and professional development. Potential areas for joint research include soil nutrient and moisture management, soil health remediation, restoration of farmland waterways, and sustaining healthy bee populations for pollination services.

44TH IN THE WORLD FOR AGRICULTURAL SCIENCE

The University of Tasmania was named among the top 50 universities in the world for agricultural science in 2017 – further strengthening our reputation for world-class agricultural research.

TIA Director Professor Holger Meinke said the ranking was reflective of the outstanding research being conducted within TIA and collaborating disciplines.

The result follows the QS World University Rankings by Subject announced earlier in 2017, which places the University of Tasmania in the top 100 for agriculture for the second year running.

“It is a fantastic result that the University of Tasmania has been ranked the 44th best university in the world and 4th in Australia for agricultural sciences. This shows that we are leading the way when it comes to research with local impact and global relevance,” Professor Holger Meinke.

“International recognition of our strong performance in agriculture reflects the hard work, dedication and passion of our researchers, teaching staff and support team.”

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“Global problems require global solutions that can only be developed through real and functional partnerships. We should advance knowledge partnerships in ways that retain our competitive advantages while sharing our expertise.”
TEACHING & LEARNING

HIGHLIGHTS

MASTERCLASS IN HORTICULTURAL BUSINESS

FUNDING: The Masterclass is led by the Tasmanian Institute of Agriculture (TIA) and funded through Hort Innovation. It was tailor-made for Australian entrepreneurs in horticulture with the expertise from the University of Tasmania, Wageningen Academy in the Netherlands and New Zealand’s Lincoln University.

Commencing in 2017, the Masterclass in Horticultural Business has received strong interest and is gaining a reputation as a top provider of leadership and management skills for upcoming leaders.

It is exclusively available for the horticulture industry and helps people take their careers to the next level by developing knowledge and practical skills to further develop their business.

More than $200,000 worth of industry-supported scholarships were available in 2017 to cover the full cost of tuition for up to 22 participants.

Testimonials from participants:

Hugh is in his mid-30s and established a business not long after completing year 12 that has grown to employ around 150 people. Since completing the Masterclass, Hugh has further developed his business and was awarded the 2018 NAB Vegetable Exporter of the Year.

Sonia and her husband operate a successful plant nursery just outside Sydney and Sonia is a past president of the Nursery and Gardens Association in Australia. She saw this course as an opportunity to obtain a university qualification – a life-long goal – and has since articulated to the Associate Degree in Applied Business with University College.

Daniel has a young family and a passion to buy his own farm. He used this course to produce a business plan that he successfully took to the bank to get a loan. He is now converting the farm from pasture to intensive vegetable production and has developed a business arrangement with his employer. Daniel was announced as the 2018 Victorian Young Grower of the Year.

“…The industry’s future success depends on a resilient, adaptable and innovative workforce that is equipped to change with industry demands. With this in mind, the program will provide students with practical knowledge and business skills that can be immediately put into practice, helping them take their businesses to the next level,”

Masterclass Leader Associate Professor Alistair Gracie.
STRONG COMMUNITY SUPPORT FOR TOMORROW’S AGRICULTURAL LEADERS

Future agricultural leaders were acknowledged and celebrated at the 2017 University of Tasmania Agriculture Scholarships Presentation.

Nine promising agricultural students received scholarships worth approximately $150,000 at the presentation ceremony held at Agfest.

TIA Director Holger Meinke said there was strong support from industry and community partners to ensure Tasmanians, including those from regional areas, have the opportunity to study agriculture.

“A degree in agriculture set students up for diverse career opportunities and allows them to tackle some of the world’s biggest challenges, such as global food security and climate change. The agricultural industry is crying out for qualified people to employ and we find many of our graduates are offered jobs before they graduate,” Prof Holger Meinke.

AGRICULTURE GRADUATE RECEIVES $120,000 SCHOLARSHIP TO CONTINUE STUDIES

University of Tasmania agricultural graduate, Madeline Way, received a prestigious $120,000 Westpac Future Leaders Scholarship to continue her research into Tasmania’s cider industry.

Ms Way’s honours project (completed in 2016) looked at four different varieties of apples (Bulmer’s Norman, Pink Lady, Red Delicious and Sturmer) and the ways pre-treatments could improve the quality of the apple juice for cider-making. The research had strong support from Tasmania’s cider industry and she is keen to continue this through a PhD.

“I really enjoyed getting out into the field, working with industry and finding out more about this emerging industry and how it can be supported through science. As a result of studying agricultural science I've become really passionate about the cider industry. I know that's where my future lies and it's something that I'm really keen to get into, which is why I applied to do my PhD in cider with the University of Tasmania,” Madeline Way.
CREATING INTEREST IN CAREERS IN AGRICULTURE

We engage in numerous targeted activities to inspire the next generation of agricultural researchers, farm managers, consultants and service providers.

Professional Development for Secondary Teachers

Each year we hold a two-day professional learning workshop for secondary school teachers. The workshop is free to attend and includes practical experiments, visits to local producers, and a resource booklet that teachers can use to run activities in their classrooms.

Feed Your Mind, Feed the World Camp

Feed your mind, feed the world is a three-day camp experience for students wanting to learn about exciting career opportunities in agricultural science. Many participants go on to enrol in an undergraduate degree at the University of Tasmania.

The camp is free to attend and open to Year 11 and 12 students who have an interest in agricultural, biological, chemical, and environmental science and would like to see the exciting and rewarding careers available to those who study agriculture at the University.
A lively panel discussion about the future of Tasmania’s food and agriculture sectors was a highlight of our first National Agriculture Day celebration. Held in Hobart on 21 November, the event attracted close to 100 people with an interest in agricultural related issues including the marketing of food and the impact of emerging trends in agricultural technologies.

Panellists included Dr Michelle Phillipov, Senior Lecturer in Journalism, Media and Communications; Associate Professor Stephen Cahoon, Director of Sense-T; Dr Beth Penrose, Lecturer in Pasture Science (TIA) and Associate Professor Laurie Bonney, Researcher of Value Chain Innovation (TIA).

“A lot of people look to technology as being a silver bullet that will solve a lot of issues but that’s not the case. What it will be is an enabler that will help us rethink some of the ways we do things, help us gain more precision in what we do, and provide us with the evidence that we need. Technology will be the way that we will look at the problem differently,” Assoc. Prof. Stephen Cahoon.
ENGAGEMENT SNAPSHOT

SCIENCE WEEK WEBINARS

We held our first-ever live-streamed webinars during National Science Week, providing an opportunity for the community to hear from two of our engaging and highly-qualified researchers about the important role that science plays in our agricultural industries.

TIA Soil Scientist Dr Bill Cotching shared the challenges, reality, expectations and perceptions derived from 40 years of working on farms with farmers.

TIA Pasture Scientist Dr Beth Penrose led a discussion about the important role that pastures play in our agricultural industries.

SHARING IDEAS FOR THRIVING AND SUSTAINABLE LANDSCAPES OF THE FUTURE

Adapting to Tasmania’s changing landscape, the new positive carbon agenda and a smarter farming future were all topics on the agenda at the University of Tasmania’s School of Land and Food conference held in June.

The conference included presentations from 70 researchers over three days – a fantastic demonstration of the scope and quality of research that will shape the future of our landscapes by making them more sustainable and liveable.

“Together we are tackling some of the world’s most significant problems relating to food and agricultural sustainability, understanding the effects of climate change, managing wilderness and agricultural regions, earth observation, and the social and cultural importance of place.”

“The University is home to internationally leading researchers and innovative postgraduate students in the fields of geography, spatial science and agriculture and food systems,” Professor Holger Meinke.
ENGAGEMENT SNAPSHOT

FORTHSIDE RESEARCH FACILITY OPEN DAY

Industry and community members were invited to visit the Forthside Research Facility in North-West Tasmania, as we showcased the innovative research being undertaken to enhance the productivity, profitability and sustainability of agriculture in Tasmania.

Some of the research showcased at the event included systemic downy milder in poppies, industrial hemp trials, and soil health and management for optimum crop yields.

The event also featured presentations from national experts, including Kelby Cheyne from Remote Aviation Australia who shared current legislation around drones and led a practical drone-flying workshop. Tim Neale from Data Farming in Queensland shared his extensive experience with precision agriculture technologies and advice about getting started with agtech.

Presentations from the Open Day are available to watch on TIA’s YouTube Channel: youtube.com/user/TasInstituteofAg
ENGAGEMENT SNAPSHOT

FARM TOUR WITHOUT MUDDY BOOTS!

During 2017, we launched a virtual tour of our Forthside Vegetable Research Facility – allowing people to tour the facility without getting their boots muddy!

The tour provides an opportunity to meet some of our researchers, view the facility, and find out about current projects to support Tasmania’s agriculture industry.

Take the tour – www.utas.edu.au/tia/forthside-vegetable-research-facility

TIA AT AGFEST

We joined the Department of Primary Industries, Parks, Water and Environment (DPIPWE) in a shared marque at Agfest this year to highlight the joint venture collaboration between the University of Tasmania and State Government. With over 62,000 attendees during the three day event, Agfest is a wonderful opportunity for community and stakeholder engagement.

Our displays were interactive and engaging, with a focus on current research projects including cider productivity, precision irrigation, pasture management and food innovation.
ENGAGEMENT SNAPSHOT

FESTIVAL OF BRIGHT IDEAS

We participated in the two-day Festival of Bright Ideas, held in Hobart during National Science Week. The event attracted 2,000 students and teachers on the first day and 4,800 community members on the second day – and our interactive display was a huge hit!

The engaging and interactive TIA display focused on the science of agriculture, with a thermal drone, freeze dried fruit, and fresh honey proving very popular with attendees. This event is a valuable community engagement opportunity and feedback and interest in TIA’s role in Tasmania was overwhelmingly positive.