Charles Sturt University

Charles Sturt University Submission – University Research Commercialisation

April 2021

Charles Sturt University

Office of the Vice-Chancellor

9 April 2021

The Hon Alan Tudge MP
Minister for Education and Youth
Parliament House,
CANBERRA ACT 2600
By email: alan.tudge.mp@aph.gov.au

University Research Commercialisation

Dear Minister

Charles Sturt University welcomes the opportunity to provide feedback on your Department's *University Research Commercialisation* discussion paper.

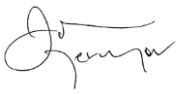
Charles Sturt has strong research partnerships with local, national and international companies, as well as all levels of government, regional development bodies, and public agencies. An excellent example of the University's industry collaboration, knowledge translation and commercialisation is the AgriSciences Research and Business Park (AgriPark), on our Wagga Wagga campus. The AgriPark is a world-class, science-based and business-oriented innovation precinct in the Riverina. Hosting state and private enterprises and more than 120 staff, the AgriPark supports research, development, innovation and commercialisation to drive productivity growth in our agricultural and food sectors, leading to tangible economic, social and environmental benefits for the nation.

Charles Sturt suggests the proposed commercialisation scheme should embrace a definition of industry that includes not-for-profits, government entities and other non-commercial organisations. The new scheme could take advantage of the under-realised potential of knowledge transfer activities in regional areas, involving regional partners, given investment in regional research and innovation can lead to proportionally greater economic impact than in metropolitan centres.

The Australian Government has taken steps to improve the situation through the Job-ready Graduates reforms and the Regional Research Collaboration Program launched this month. The proposed commercialisation scheme offers a further opportunity to rebalance the focus of public and private investment in research commercialisation by ensuring that regional communities also benefit from such investment. The Government's efforts in this regard would be enhanced by ensuring regional representation in the governance arrangements for the new scheme.

Charles Sturt looks forward to engaging with the DESE in the development and implementation of the new scheme, and to building on our relationships with regional industries and communities.

Yours sincerely



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Research Commercialisation consultation paper – Charles Sturt University response

While the University's submission is focused on responding to the discussion questions posed in the consultation paper, there are two headline issues that warrant comment.

First, the proposed model for research commercialisation should encompass a broad definition of commercialisation: one that, through the new funding scheme, encourages and supports knowledge translation in all forms, including the 'public good', non-economic value creation and enhancements to quality of life, and not just commercialisation involving intellectual property (IP) in the form of patents, licenses, and so on. This includes knowledge transfer that results in improvements in productivity, processes, service delivery and other forms of economic impact, noting that some forms of knowledge transfer will be difficult to measure.

As is the case with all Australian universities, and particularly regional universities, Charles Sturt is engaged in knowledge translation that results in significant social, environmental and economic benefits, but does not necessarily involve protected IP or generate significant income for the University. Examples of such work are provided as an attachment to the submission.

A broad definition of commercialisation – one which considers wider economic impact as well as revenue generation – would be consistent with the principles set out in the recent (January 2021) Industry Innovation and Science Australia report, *Driving Effective Government Investment in Innovation, Science and Research*.

Second, the model should also embrace a similarly broad definition of 'industry' that includes all end users of research: government agencies and other public sector organisations, social enterprises, and not-for-profits, as well as private enterprise.

Both these issues should be addressed in the design of the new commercialisation scheme, its governance, and any metrics or performance indicators.

RESPONSES TO DISCUSSION QUESTIONS

1. Mission-driven research

a) Are Missions the appropriate priority-setting mechanism? Should they be accompanied by smaller, targeted Challenges?

Missions are an appropriate mechanism for setting priorities, provided they are measurable, have significant cross-sectoral industry input, and are focused on economic, social and environmental needs and objectives. They should be supported by smaller, targeted 'challenges' that allow for participation by a range of firms (including SMEs) and research providers. By their nature, the Missions would have a long timeframe and require sustained investment, while the challenges would be more focused, short-term, and involve targeted funding. Reporting requirements should be commensurate with the scale of the project and the level of investment.

The Missions should be relatively few in number, so as not to dilute effort, and integrated across different portfolios. For example, at present the Australian Government's Agriculture portfolio has a strategy and plans for increasing the value of the nation's agricultural sector,

and the Industry portfolio has manufacturing priorities that include Food and Beverages. It would be possible to develop a Mission and 'challenges' that would meet the goals of both portfolios. This would require the development of an integrated response and reporting/accountability framework, reducing the administrative burden for universities and the barriers caused by different departmental 'silos' (see also the University's comments on governance arrangements in response to 5(b), below).

Missions and challenges could be focused on regional priorities developed in consultation with regional communities. Examples include improving health outcomes for regional residents, or bridging the digital divide. Ideally, such Missions would provide targeted support to regional industries and research organisations, so as to ensure regional needs are met by industries and organisations in those regions, rather than by large metropolitan institutions that already receive substantial funding and have only small footprints in regional areas.

b) What criteria should be used to select Missions?

Missions should address a broad range of research priorities that align with industry and community needs and expectations. They should be ambitious and lead to a range of economic, social and environmental outcomes, including improved well-being and prosperity for a broad segment of society.

The selection of Missions and challenges should involve broad consultation. This can and often should be a time- and resource-intensive process, but a patient approach is justified by the level of investment involved. A consultative approach also helps build industry, community and researcher support for and engagement in the Missions.

c) Is Australian research sufficiently linked to demand? Where are the opportunities to link supply to demand?

Applied research, such as that undertaken by Charles Sturt, is typically linked to demand as we derive much of our funding from Rural Research and Development Corporations (RDCs), which set funding priorities based upon industry requirements.

Improved support for industry led research should be a feature of Mission driven programs. They should also consider the profiles of Australian industries and their respective R&D efforts and capabilities.

In some cases, domestic demand may not be enough to drive collaboration or generate sufficient investment, and in these cases mechanisms or pathways for global investment should be part of the Mission design.

d) How can university researchers identify this demand?

Unless they have good links to industry, university researchers are often poorly placed to identify industry related priorities, and the skills required for building and maintaining relationships with industry are somewhat different from those that drive excellent research performance. There are existing programs and initiatives that help overcome this gap in skills and knowledge, but more effort would be helpful. For example, one of Charles Sturt University's industry partners suggested the Australian Government could support engagement training, mentoring and coaching programs for PhD students, early career researchers and prospective industry partners, along with 'matchmaking' opportunities. Other examples include cross-sector working groups, exchanges and secondments, and particularly activities involving

senior executives from industry and universities aimed at improving each sector's understanding of the other's culture, expectations, needs and limitations.

2. Stage-gated Scheme design

a) Is a stage-gated model suited for the purpose of the Scheme?

Stage-gated funding is probably well suited to a mix of 'blue sky' and 'proof of concept' research that has clear potential for application to industry research priorities. An example might be development of advanced technology solutions for agricultural and food sample assessment by employing technologies typically used in medical imaging or other sophisticated analysis platforms. A stage-gated approach would require effective project management and experienced governance from the start of the process.

b) What is the appetite from industry and private investors to participate in such a Scheme?

Industry and private investors will assess risk prior to investment and if risk the is too high or potential benefit too far away (in time or place) then they will not invest. Reluctance to invest in highly speculative projects is a consequence of perceived risk. In such cases, government sponsorship of a project can influence how prospective industry partners assess the risk, leading to greater engagement between universities and industry, especially in projects that involve an element of 'pure' or basic research.

Industries that support research through levy payments (e.g. agricultural commodities) can also be averse to providing additional funding for blue sky projects due to their awareness that they are already supporting research through organisations like RDCs, and a focus on short- to mid-term expenditure and returns. The challenge is even greater when the project under consideration does not align well with RDC priorities. In such cases, government support can send an even stronger signal to industry partners.

There is also scope for models of cooperative investment in R&D that are not industry specific. For example, regional industries and communities could take a collaborative approach to R&D, drawing on a range of state, Commonwealth, industry and other funding to support R&D aligned to the needs of specific regions rather than industries.

e) How should the success of projects be measured?

The success of Missions can only be gauged over time, and some may not lend themselves to easily measured outcomes so any evaluation will need to involve a mixture of performance and success indicators. As noted above, this could include examining the impact of Missions and challenges on public policy, industry and professional practice, well-being and non-economic value creation, as well as commercial returns.

3. Incentives for participation

a) What broader incentives influencing the business and university sectors may influence their participation in a Scheme?

The surety provided by strategic, long-term investment would be a key incentive for researchers and industry.

Retaining highly skilled people in research requires clear long-term career paths. This can involve a researcher moving between different organisations, public and private, but wherever they are it is vital they understand what their next career step could be. At present, however, funding and policy settings for research lead to short-term employment, often tied to specific projects, resulting in greater employee churn and interruptions to project momentum. This is exacerbated for regional universities who do not have the financial means to retain talent between externally funded projects by using internal funding. Mission-driven research, by its nature, requires sustained, long-term and strategic investment, and long-term appointments for researchers.

Sustained investment combined with more secure employment for researchers helps Australia attract, retain and develop talent; build scale and capacity; improve strategic competitiveness; generate momentum, and, most importantly in the context of commercialisation, provide the time that researchers need to engage effectively with their industry partners.

Strategic, long-term research leading to joint ventures offers the potential to develop alternative income streams that support ongoing business activities for both universities and enterprises.

There are also disincentives that need to be taken into consideration. The current policy and funding settings for universities (especially Research Block Grants) do not incentivise collaboration between universities, and in some cases can even impede collaboration because of an overly rigid approach to how research income from jointly-managed projects is counted. Competitive grant schemes in which publications are a significant factor can deter individual researchers from building relationships with industry partners if they do not lead to peer-reviewed publications.

b) What would motivate businesses, universities or private investors to invest in this Scheme?

Typically, business operates on a short timeframe for return on investment when compared to universities. Incentives for business investment, especially in blue sky research, must be financially viable and commensurate with short term business goals, or provide long term incentives for business to invest through, for example, improved tax support of funding schemes. This could include changes to the R&D Tax Concession to support the Government's goal to increase collaboration between industry and researchers and boost commercial returns from investment in research.

There is also scope for existing industry innovation funding programs to support skills development within firms, focused on improving their ability to identify their innovation and research needs, and build programs and teams to meet those needs – ideally in collaboration with universities.

Regional businesses could be motivated to invest in research commercialisation if there are long-term Missions specific to regional needs and challenges. The certainty provided by long-term Missions with strong Government support would encourage the investment of 'patient capital' by regional businesses, especially where they can see the Mission's relevance and benefits to their community.

c) Aside from co-funding, should universities or businesses have any additional requirements for participation?

Co-funding should not be a requirement for universities to participate in the scheme. Universities are not research funders: their role is to provide the personnel and infrastructure to

deliver on research and commercialisation priorities, and to deliver the skilled graduates employers need to build capability and productivity.

Identified research priorities should be funded in the location where the capacity to deliver on those priorities exists, and also where there are existing linkages between universities and industry that can be leveraged to address identified priorities.

This is particularly important with regard to priorities for or about regions, or in industries with a significant footprint in regional areas. Funding regional universities to address regional priorities will be more effective than funding metropolitan universities to do so. Even when metropolitan universities have a presence in a region, the bulk of their research capability is based at their main campus, and while recent experience has shown the potential for remote collaboration, there is ample research that underscores the importance of face-to-face contact and personal relationships to effective collaboration, especially in projects where risk is a factor. Regional universities are, quite literally, already 'on the ground', well-apprised of the challenges and opportunities, and have existing relationships with a range of industry partners. Any capability gaps in a region can be met through collaboration.

Collaboration should, in any case, be a priority in any Mission-driven approach to research, as drawing on expertise from multiple organisations offers the best prospects for truly novel solutions. For example, combining the expertise of metropolitan and regional universities would allow for the application of novel analytical chemistry solutions to agricultural commodities.

4. Industry-university collaboration

b) Would an Industry PhD program help improve collaboration outcomes?

An Industry PhD program could help improve collaboration outcomes, though it would need the flexibility to include both short-term projects aligned to industry needs and timeframes as well as the kind of long-term research that is essential to any PhD.

Research performance metrics (and their place in global rankings) depend in part on research outputs produced by Higher Degree by Research (HDR) students. The number of HDR completions (and to a certain extent the number of HDR students) also drives funding. This has created global competition for HDR students, one in which well-resourced universities (typically metropolitan and with substantial cash and asset reserves) can offer a variety of incentives to attract students, even when those students have already started their research project at another institution.

In Australia, this competition for students too often works to the disadvantage of regional universities, and by extension regional industries and communities. One consequence is that regional universities need to invest significantly greater time and resources to attract, support and retain their research students.

An industry PhD program could help address this problem, by keeping or attracting high-calibre research students and engaging them in projects aligned to regional priorities – provided the program is structured in a way that ensures both the focus and high-quality outputs commensurate with a research higher degree. Masters and Honours programs could also be part of the mix.

As with other forms of collaboration, IP can also be a barrier to research students engaging with industry. HDR students generate IP, but there is at present no consistent approach to the

ownership of this IP, especially as embodied in their thesis or other publications. A national set of guidelines covering research students' IP would be useful.

c) Are there skills gaps in academia or business that inhibit collaboration or commercialisation?

Charles Sturt suggests there are two key skills gaps that inhibit collaboration and commercialisation: identifying how research can help a business, and understanding the role of IP.

Industry partners are usually able to identify and describe priority issues and challenges but can struggle to articulate just how or what R&D might best deliver effective responses. This indicates there is a gap that could be addressed by facilitators or brokers who can assist businesses in identifying the scope for R&D and innovation, and match industry or community with the 'right' university partners. They may also be able to assist businesses with managing the risks associated with research and innovation (see 2(b), above), and with project planning and governance.

The identification, management and valuation of IP has also often been identified as a significant barrier to university-industry collaboration. This can result from a poor understanding of the Australian and international framework for IP, the different kinds of IP, the resources required to manage it (including, for example, the cost of filing a patent), and unrealistic expectations about income from IP. This is a particular challenge for regional universities and businesses, who may not be able find, recruit or retain skilled IP advisers in their region. The cost of using expert advisors from metropolitan centres can be very high, presenting an additional barrier.

Collaboration and commercialisation in regional areas could therefore be boosted by developing a model for flexible and cost-effective provision of IP advice to universities and businesses.

The Australian Government's Entrepreneurs' Program offers a potential model for deal with both these skills gaps.

5. Governance arrangements

a) What stakeholders should be involved, and where, in the governance arrangement?

Governance of the scheme should involve stakeholders from industry, universities and government. This would include representation on the board or committee administering the scheme.

b) What type of Governance arrangement is best suited for the Scheme?

The CRC Program offers some useful and effective models for the kind of governance required. This would involve a mix of research and industry representatives, ensuring that different kinds of universities are involved. Industry representation may change in line with Government priorities.

Charles Sturt also suggests that the governance arrangements could include representatives from other Australian Government departments and agencies with a stake in research and commercialisation, such as Agriculture, Water and the Environment, Defence, and Health. This would provide for more effective integration of R&D investments and policies across government.

c) *How should projects be selected and managed?*

If the commercialisation scheme is to fund specific projects, the selection process should consider the particular challenges faced by regional universities and businesses, some of which have been outlined above.

Management of the projects is best determined on a case-by-case basis, though the scheme could provide models for consideration.

d) *How can the Governance arrangement minimise administrative burden whilst also minimising risk?*

The Scheme presents the opportunity to devise a UK Catapult Network like structure that would aggregate industry, universities, CSIRO, RDCs, CRCs etc in nominated areas of national priority aligned to their missions. In this way, the significant challenges faced by business and the wider society can be addressed with agility and speed.

Attachment – Industry engagement and research impact at Charles Sturt

Charles Sturt University researchers collaborate with businesses and the community to find new ways to create meaningful impact on local, national and global levels.

The case studies below highlight the breadth of research at Charles Sturt University, and our ability to bring together experts from a range of disciplines to explore real world problems.

Our research generates insights to address issues of deep social significance, inform policy and decision making, improve business productivity and competitiveness, and help people and communities to flourish.

For more examples visit https://research.csu.edu.au/engage-with-us/research-impact

EVERGRAZE – IMPROVING LIVESTOCK FARM PROFITS AND SUSTAINABILITY

Charles Sturt University partnered in EverGraze, researching how livestock enterprises could make management decisions about when, where and how to use perennial plants to increase productivity and profitability, while also looking after the sustainability and resilience of the land.

A profitable farming business and a farm managed for environmental sustainability? Ask around, most farmers will tell you that the best way to have a profitable farming business over the long term means looking after your land. But making the best decisions for individual farm systems requires good information.

EverGraze was a national program of research, looking at how perennial plants could be used in different livestock enterprises to increase farm profitability while also improving the environment by reducing ground water recharge and soil loss in the high rainfall zones of southern Australia.

The research

The messages about farm management coming out of EverGraze are different to the recommendations that usually come from agricultural research. The emphasis is not on encouraging widespread adoption of best practice recommendations. Instead, the main message is that every livestock farm business is unique and complex, and primary producers need to be able to make on-farm decisions for their circumstances.

As a key partner in EverGraze from 2003 to 2014, an important goal was to generate information that was relevant and accessible to farmers. A range of factsheets, calculators and tools were developed out of the research. They help farmers to assess their options, understand the consequences of different practices, and to make decisions that suit their farm context. The research provides good evidence to identify alternative practices to reduce risk by making system-based decisions.

Farmers and consultants served on regional advisory groups and were critical to translating the research results into communications that changed farm management practices.

Program highlights

- A national program of research bringing together over 250 experts, including scientists and researchers, agricultural consultants and farmers.

- Looking at real livestock farming systems from high rainfall areas of Southern Australia to understand what changes to a system could increase profits and improve the environment.
- Farmers and agricultural consultants were included throughout the program, helping to make findings realistic and relevant.
- Offering a new approach to pasture and livestock management through a 'whole farm system' approach.
- Helping livestock producers make decisions by helping them to evaluate their farming system.
- Making the findings and tools accessible for producers.
- Real changes to farming practices, improving both profitability and the natural resource management of farms.

Funding and collaborators

Evergraze was a Future Farms Industries CRC research and delivery partnership. More information about the funding and collaborators can be found at evergraze.com.au

DIABETES SCREENING CLINIC IMPROVES COMMUNITY HEALTH

The global incidence of diabetes and associated complications are increasing. This requires better methods for diagnosis and treatment, particularly in rural areas where access to specialist equipment is limited and there are fewer health professionals and medical practitioners.

To combat this problem, Charles Sturt University researchers, led by Associate Professor Herbert Jelinek, developed an all-in-one program that provided annual comprehensive health checks. These health checks included: blood sugar level, cholesterol levels, blood pressure, body mass index (BMI), cardiovascular assessment, eye examination, and a foot assessment.

The program found previously undiagnosed diabetes-associated disease, including life-threatening cardiac complications. The research led to improved quality of life and reduced morbidity and mortality for program participants.

The research developed new and novel health screening tools that were used to assess patient health. These included:

- an automated program to identify diabetic retinopathy using colour images in non-dilated pupils that were not injected with colour contrast (Charles Sturt University was the first to develop this technology)
- an analysis tool for identification of retinal vessel proliferation
- an automated tool for identification of cardiac autonomic neuropathy based on heart rate recordings
- identification of eight novel blood-borne biomarkers associated with preclinical diabetes
- investigating the initial allied health impact of the automated wound analysis tool (W.H.A.T.)

Program highlights

- Research developed an all-in-one diabetes screening program
- Patients assessed in one visit
- Multiple health conditions are investigated
- Found numerous instances of diabetes-related illness

- Identified patients in need of urgent medical assistance to treat life-threatening vascular conditions

Program impact

Patients participating in the screening program obtained improved health outcomes, particularly for those that needed immediate acute treatment for life-threatening complications. Participating general practitioners were also positive and provided feedback on the clinic and project, noting “the support it provides to the medical community”.

A form of Charles Sturt University’s all-in-one health screening is now being incorporated into health service provisions by the Medical School of Western Sydney University. Additionally, a similar program to the Charles Sturt University - developed eye screening tool is used by the National Health Services in Scotland.

Funding and collaborators

Funding for the research was provided from a series of internal Charles Sturt University grants and research fellowships, plus support from the Australian Diabetes Society.

The research was conducted in collaboration with several national and international universities including the Universities of Sydney, Newcastle, La Trobe, Sao Paulo, Waikato, Campinas, Khalifa and Vienna.

AGED CARE – UNDERSTANDING THE EXPERIENCES OF OLDER PEOPLE AND INCLUDING THEM AS PARTNERS IN SERVICE PROVISION.

Rural older people are very connected to their communities but there can be a lack of services and residential care to keep them where they want to live. To address this problem, Charles Sturt University researchers investigated the experience of ageing for people living in rural Australia.

The findings showed that when older people cannot access services and care locally, this can have devastating impacts on them, their families and their communities. The participants reported feelings of disconnection, isolation, depression and distress. Importantly, the research demonstrated older people who moved from a small, rural aged care facility to a larger centre died prematurely.

Research associated with older persons accessing residential care and care facility nutrition and hydration concerns used interviews with participants who shared their perspectives when friends or family members were placed in a residential care facility. The new aged care assessment model model ‘Staying Active, Staying Independent’ (SASI) was developed following interviews with older persons and a focus group of aged care workers. SASI asked the older person what was most important to them and initiated strategies to enable older people to achieve the goals they themselves set.

Program highlights

- Research identified that older persons feel isolated when forced into residential aged care and that once in care nutrition/hydration were often inadequate.
- Research findings contributed to the Department of Health and Ageing changing aged care regulations.
- The research participated in the development and evaluation of a new assessment model 'Staying Active, Staying Independent' that in contrast to previous models, asks older people what they want from community service providers.
- The new SASI assessment model allowed identification and repair of issues that reduced quality of life for older persons.

Program impacts

The research found wide variation in the quality of care in aged care facilities. For example, it was identified that inadequate access to nutrition and hydration by some older people in residential aged care led to malnutrition and dehydration. Family members shared traumatic recollections about the inability of relatives in residential care to physically access food when insufficient staff were available to assist them, where staff were too busy or where the food was of poor quality.

The research team provided a submission to the NSW Government Inquiry into Registered Nurses in NSW Nursing Homes, which led to the Principal Investigator (Professor Maree Bernoth) being invited to appear before the Inquiry. Professor Bernoth's findings on the clinical care of residents were cited 47 times in the Inquiry's final report and ultimately led to the Department of Health and Ageing changing the guidelines for nutrition and hydration in aged care. Professor Bernoth also presented the research findings to the Australian Law Reform Commission Inquiry into the Prevention of Elder Abuse.

The SASI assessment model asked the older person what was most important to them and initiated strategies to enable older people to achieve the goals they themselves set. Quality of life improvements followed SASI's implementation. For example, loss of mobility prevented an elderly woman from meeting her sister at the Hobart Theatre, which was a routine activity prior to her functional decline. SASI identified that physiotherapy was required, and after treatment, the elderly woman regained mobility and resumed visiting the theatre.

Funding and collaborators

Improving outcomes for older persons resulted from two research programs.

- Research associated with older persons accessing residential care and care facility nutrition and hydration concerns was funded by Charles Sturt University and conducted by Professor Maree Bernoth, Associate Professor Elaine Dietsch, and Dr Carmel Davies.
- The SASI assessment model was developed in collaboration with the Hobart District Nursing Service who also funded the research. Charles Sturt University researchers Professor Maree Bernoth, Associate Professor Oliver Burmeister, Professor Mark Morrison and Associate Professor Zahid Islam conducted the research.

ECOLOGICAL PEST CONTROL

A Charles Sturt University-led research team, in partnership with various Australian and international stakeholders, successfully developed innovative new ecological tactics to reduce crop losses, lessening the need for insecticides in rice crops whilst boosting yields.

In one of the projects, a multi-site field study was conducted in Thailand, China and Vietnam over a four-year period. Nectar-producing plants were grown around rice fields to attract beneficial insects. Crops were monitored for levels of pest infestation, insecticide use and yields. This research led to widespread adoption by farmers in Asia. Related studies in Australia have led to impactful findings for commodities as diverse as cotton and forestry.

Program highlights

- Revised farm management practices
- Reduced crop losses and reduced need for insecticides for rice, cotton and pine crops
- New practices were widely adopted in East Asia and are national policy in China
- A new crop protection product based on plant compounds called EcoOil

Program impacts

Use of the ecological tactics led to revised farm management practices by rice farmers in China, Vietnam and Thailand, as well as by pine and cotton growers in Australia. The research also led to the development of a novel crop protection product based on plant compounds used in Australia and Turkey.

Rice

Tactic: Farms plant nectar-providing crop plants near the borders of rice fields to enhance the activity of the natural enemies of pests.

Results:

- Reduced insecticide use by two thirds
- Rice grain yields increased by 5%, and profits increased by 7.5%
- Reduced exposure of growers to insecticides
- 3x increase in animal species that contribute to the nutrient cycle
- A 40-episode TV series that screened in Vietnam resulted in a 19% reduction in insecticide use
- In China, the National Agriculture Technology Extension and Service Centre of the Ministry of Agriculture recommends this strategy at a national level.

Cotton

Tactic: Leaving perennial native vegetation near cotton crops provides a major source of beneficial insects that boost biocontrol of cotton pests.

Result: The Australian cotton industry now recommends preservation and expansion of native vegetation in cotton cropping areas.

Forestry

Tactic: The exotic bark beetle disrupted a previously successful biocontrol program against a key pest in the Australian forestry industry, the Sirex Wood Wasp. Charles Sturt University research highlighted how to minimise the effects of the bark beetle on biocontrol of Sirex.

Result: Forestry managers changed their standard operating procedures which reduced the area affected by Sirex from 1.5% in 2007-2008 to 0.2% by 2014.

Chemical Ecology

Tactic: Spraying crops with natural compounds that plants release when under attack by pests attract natural enemies of the pests.

Result: An innovative new commercial plant protection product called EcoOil was developed. EcoOil is now sold in major retail outlets throughout Australia and overseas.

Funding and collaborators

Rice

Led by the International Rice Research Institute with Professor Gurr leading the biocontrol enhancement plank within that project.

Cotton

Funded by the Cotton Catchment Communities CRC.

Forestry

Funded by the Australian Research Council (ARC) via the Graham Centre for Agricultural Innovation.

Chemical Ecology

Funded by ARC Linkage project via the Graham Centre for Agricultural Innovation, with collaborators from Lincoln University (NZ), Washington State University (USA) and Organic Crop Protectants Ltd.

Recognition

This project won the 2020 Engagement Australia Excellence Award for Outstanding Engagement for Research Impact. The Engagement Australia Excellence Awards identify and celebrate the most exciting and impactful engagement activities undertaken by Australian and New Zealand universities. The 2020 Awards were hotly contested with over 130 entries from 30 universities.

AUSTRALIAN INTERNATIONAL TRADERS

This research report became a catalyst for a reversal of the Australian Government's decision to not introduce Authorised Economic Operator (AEO) program.

Following the 2001 terrorist attacks in the United States, international organisations developed initiatives to secure international supply chains against terrorist and other threats. Australian traders were disadvantaged by the Australian government's decision to not join an international trade facilitation scheme in 2012.

[Between 2015-2025] the Australian Trusted Trader programme is expected to deliver an increase in household consumption of $2.2 billion, as well as additional business investment of almost $1 billion. For the Australian industry involved in the programme … there is expected to be a substantial benefit, a direct impact of $2.9 billion and associated regulatory savings of $42.2 million.

– The Hon Peter Dutton MP

The research

Researchers from the Centre for Customs and Excise Studies, Charles Sturt University, David Widdowson, Bryce Blegen and Mikhail Kashubsky, and Andrew Grainger from the University of Nottingham, UK, published a report in 2014. The report examined AEO schemes implemented around the world, demonstrated the potential economic benefits of introducing such a scheme in Australia, and captured views and specific recommendations of industry stakeholders on what form an Australian program should take.

The research report ultimately became a catalyst for a reversal of the Government's earlier decision to not introduce an AEO program. It led to the introduction of the Australian Trusted Trader (ATT) Program in 2015, which incorporates many of the research recommendations. To date, over 600 companies have joined the ATT program.

Program highlights

- Over 600 companies have joined the ATT program to date
- Accredited companies in the ATT program receive expedited customs clearance and fewer checks
- ATT brings significant economic benefits and regulatory savings

Program Impact

ATT accreditation benefits Australian businesses involved in international trade and transport, including:

- Exporters and importers
- Manufacturers
- Freight-forwarders
- Logistics service providers
- Transport Operators
- Express Carriers
- Customs brokers

ATT better facilitates legitimate trade whilst maintaining appropriate levels of trade security. The program delivers significant economic benefits in terms of Australian household consumption, additional business investment and regulatory savings.

Funding and collaborators

Funding was provided by the Australian International Trade and Transport Industry Development Fund and Charles Sturt University.

Major industry associations involved in the research project include:

- Customs Brokers and Forwarders Council of Australia Inc
- Export Council of Australia
- Australian Federation of International Forwarders
- Conference of Asia Pacific Express Carriers
- Shipping Australia Limited
- Australian Chamber of Commerce and Industry