



Charles Sturt
University

NATIONAL AGRICULTURAL LABOUR
ADVISORY COMMITTEE

National Agricultural Workforce Strategy Discussion Paper

1 June 2020

Office of the Vice-Chancellor
Charles Sturt University



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Mr John Azarias
Chair, National Agricultural Labour Advisory Committee
Department of Agriculture, Water and the Environment
GPO Box 858
Canberra ACT 2601

Dear Mr Azarias

On behalf of Charles Sturt University, I am pleased to provide this submission to the National Agricultural Workforce Strategy Discussion Paper.

Charles Sturt University is uniquely positioned to support the work of the National Agricultural Labour Advisory Committee. We are Australia's largest regional university, with more than 43,000 students and approximately 2,000 full time equivalent staff. The University's footprint covers a huge area in the Murray-Darling Basin, the nation's food bowl, with campuses at Albury-Wodonga, Bathurst, Dubbo, Goulburn, Orange and Wagga Wagga, as well as Canberra, Manly, Parramatta, and Port Macquarie.

Charles Sturt University produces the largest group of agricultural science graduates in Australia every year, and our students are drawn from across the country and around the world. We enjoy strong ties with food producers, processors, suppliers and exporters. These relationships are reflected in the industry placements central to many of our courses and the practical focus of much of the University's research.

This submission draws on our links to regional communities and industries, the knowledge of Charles Sturt University academic staff, and our recent submission and evidence to the House of Representatives Standing Committee on Agriculture and Water Resources inquiry into growing Australian agriculture to \$100 billion by 2030. It was my pleasure to welcome the Committee to Charles Sturt's Wagga Wagga campus in February this year for a public hearing and a tour of our farming operation.

Charles Sturt University welcomes this opportunity to inform the development of Australia's future agricultural, education and training policies. We are more than happy to provide additional information to the Committee, and to participate in any public discussions on the implementation of the new strategy.

Yours sincerely

A handwritten signature in black ink that reads "Andrew Vann".

Professor Andrew Vann
Vice-Chancellor



Charles Sturt University response to the National Agricultural Workforce Strategy Discussion Paper

Charles Sturt University traces its origins to the formation of the Bathurst Experimental Farm and Wagga Wagga Experimental Farm in the 1890s. In one form or another, agricultural research, innovation and education has been integral to the University's character and mission for more than a century. We can proudly claim to have educated generations of Australia's agricultural workforce. Today, we draw students from across Australia and around the world – especially, in the latter case, for our postgraduate programs.

Charles Sturt University accounts for about a quarter of Australian agriculture students and graduates, and we have a proven track record of high levels of graduate employment. On average, 80% of regional and remote area students who study on campus with Charles Sturt go on to be employed within regional and remote Australia. All told, the University has a pivotal role in educating the regional workforce – in agriculture, certainly, but also in associated industries and in the businesses and services that make for vibrant regional communities.

Agriculture at Charles Sturt University

Charles Sturt University offers undergraduate and postgraduate degrees in Agriculture, Agricultural Science, Farm Production, Horticulture, and Viticulture. The programs offer a strong science base – in biology, botany, physiology and pharmacology, among other things – but also include farm and environmental management.

Many of our programs include workplace learning and internships. For example, they are a notable feature of the viticulture courses, which complement a strong science base with hands-on learning in industry.

Agriculture is an acknowledged area of research strength for the University. Charles Sturt has been consistently rated at or above world standards for Agricultural and Veterinary Sciences research in successive 'Excellence in Research for Australia' (ERA) assessments by the Australian Research Council (ARC).

Three of our four major research centres draw on the University's strength in Agricultural and Environmental Sciences, and are important draw-cards for researchers and research students.

1. Established in 2005, the Graham Centre for Agricultural Innovation aims to be Australia's centre of excellence for innovation in grain and red meat production and value adding. The Centre has partnerships with the NSW Department of Primary Industries (DPI), global biotechnology company Syngenta, and strong international links. The Centre is currently undertaking international research projects worth approximately \$8.9 million, with the majority of the funding coming from the Australian Centre for International Agricultural Research (ACIAR).

The Centre produces bulletins, fact sheets, and monographs on topics relevant to farming systems in temperate Australia. These are high-quality publications, peer reviewed or based on peer reviewed science, but they are produced for practical use rather than to drive academic citations. These publications are available from the Centre's web site.

2. The Institute for Land, Water and Society is a multi- and trans-disciplinary research centre that carries out biophysical, social and economic research to address local, regional, national and global issues.

The Institute has an extensive range of local, national and international partnerships with industry, government departments and agencies, NGOs, intergovernmental organisations and other universities and research centres. It has attracted funding from the ARC, ACIAR, CSIRO, Rural Research and Development Corporations, industry, peak bodies and international partners including the National Geographic Society and the United States Agency for International Aid (USAID).

Research at the Institute is undertaken within four thematic (but not mutually exclusive) areas: Biodiversity Conservation, Environmental Water, Rural and Regional Communities, and Sustainable Development.

3. The National Wine and Grape Industry Centre (NWGIC) conducts world-class research in grape and wine science. The Centre works closely with the NSW DPI, the NSW Wine Industry Association, the Wine Grapes Marketing Board, and commercial vineyards and wineries.

Research at the Centre is focused on plant pathology, vine physiology, fruit development, fruit and wine composition, sensory characteristics of wine, and consumer preference. Like the Graham Centre, the NWGIC produces a range of resources for viticulturists and wine-makers including fact sheets, management guides and the FitVine mobile app.

Agriculture education and research at Charles Sturt is enhanced by our experimental farm, equine centre, vineyard and winery, as well as a range of technical and industry standard facilities including laboratories, greenhouses, and working models of different irrigation systems.

The 1400 hectare farm on the Wagga Wagga campus incorporates precision agriculture technologies, sheep and cattle herds, animal handling facilities, and provides a platform for collaboration with the NSW DPI Wagga Wagga Agricultural Institute.

The University's Rhizolysimeter (underground root growth laboratory) is one of the largest root growth and soil water research facilities in the Southern Hemisphere. It is made up of 24 concrete and steel cylinders that allow for non-destructive, high resolution *in situ* measurements of root growth and soil water dynamics using a variety of sensors. The design of the facility is such that it can be used to study intact columns of soil from anywhere in the country.

AgriSciences Research and Business Park

Charles Sturt University has established an AgriSciences Research and Business Park – the AgriPark – at our Wagga Wagga campus. It is a key step in the University's long-held vision for and commitment to support, facilitate and grow the nation's agricultural sector. The AgriPark provides dedicated infrastructure, services and support to allow innovative industry to co-locate, integrate and collaborate with each other and the multidisciplinary research strengths at Charles Sturt University.

As an innovation precinct, the AgriPark will facilitate wealth creation, employment and skills development in the region. Its success will be demonstrated by the creation of new businesses, new products and new ways of thinking. Our goal is that in time the AgriPark and Wagga Wagga will be recognised as a world-leading centre for agricultural innovation, education, extension, research and development and business opportunity.



Charles Sturt University response to the National Agricultural Workforce Strategy Discussion Paper

The AgriPark also has an important role in addressing of the workforce challenges that are the focus of the Committee's work. Consultations ahead of the establishment of the AgriPark showed that there is an appetite for developing leadership across the agricultural ecosystem, from farms through to start-ups, SMEs and larger established firms. The AgriPark provides a perfect platform for leadership development and Charles Sturt would welcome the opportunity to provide the Committee with further information on the issue.

Responding to the National Agricultural Workforce Strategy Discussion Paper

Charles Sturt's history, location, and education and research profile make the University uniquely qualified to provide information to the Committee on the future of Australia's agricultural workforce, particularly in relation to the supply of graduates and the skills and knowledge they will need. We can also offer insights on some trends in agricultural production, and the challenges associated with a changing climate, evolving markets, and, more recently, a global pandemic and economic shock.

There are four key issues that we suggest the Committee will need to keep in mind in developing the National Agricultural Workforce Strategy:

1. Agriculture enrolments and graduates
2. Changing demographics in the agriculture workforce
3. Changes to agricultural practice and management
4. The need for adaptability and resilience

Agriculture enrolments and graduates

There is a significant shortage of agriculture graduates in Australia every year, a situation that has persisted over time. Professor Jim Pratley from the Charles Sturt University School of Agricultural and Wine Sciences has collated data on agriculture and related courses from across the Australian university system. His analysis shows that there are around 4,000 students enrolled in undergraduate agriculture programs, with around 850 graduating every year.

However, the number of advertised graduate job vacancies in agriculture is over 3,000 every year – more than three times the number of graduates. As noted in the discussion paper, the relatively low and static enrolments in agriculture and related fields, in spite of a strong job market, may be due to lingering perceptions of agriculture as a demanding career subject to variable pay and conditions, when the reality – and the future – is very different.

Charles Sturt University suggests the first challenge the National Agricultural Workforce Strategy should address is the need to encourage and support more enrolments in agriculture courses, a necessary step towards the steep growth in the number of agriculture graduates Australia will need over at least the next decade. This is consistent with the National Farmers Federation goal to double the number of tertiary and vocational agriculture graduates by 2030.



Changing demographics in the agriculture workforce

According to the most recent Australian Bureau of Statistics analysis¹, the average Australian farmer is male, 58 years of age, and has 37 years of farming experience. However, Professor Pratley's analysis shows that women outnumber men in agriculture and related courses, with the ratio around 55:45 across all programs. In Animal Husbandry more than 80 per cent of enrolments are women. This is not a recent development and parallels a similar trend in many science, technology, engineering and mathematics (STEM) fields in Australia.

This is an important example of the way the demographics of Australia's agriculture workforce are changing, and as is the situation with many other professions the National Agricultural Workforce Strategy will need to identify and accommodate the needs and expectations of a changing workforce. The Strategy will also need to consider what is driving this demographic change: the factors that attract women to agricultural studies and careers, or may be deterring men from these fields.

Changes to agricultural practice and management

The nature of agriculture itself is changing. The evidence presented to the House of Representatives Standing Committee on Agriculture and Water Resources inquiry into growing Australian agriculture to \$100 billion by 2030 suggests that the future of agriculture in Australia is technology based and data-driven, with an emphasis on more efficient use of all inputs.

One significant challenge in adapting to this change is that the benefits of adopting new technologies (or techniques) may not be clear to farmers – a challenge that can only be addressed through education and training.

Further, the increasing role of technologies like automation, information systems and smart sensors in agriculture suggests that we may need to shift the way we think about agriculture as a profession, recognising that it is, increasingly, a high technology one. Charles Sturt University already offers programs aligned to these trends, with units like Precision Agriculture and Data Handling, Digital Agriculture in Practice, Image Processing and Analysis, and Production Analysis and Optimisation as part of our Bachelor of Agriculture degree.

Moreover, as Australia's largest and most experienced provider of on-line higher education we have the capacity to delivery up-to-date content to agricultural workers wherever they are and whenever they need it. For example, almost all our students in viticulture and wine-making pursue their studies online while working in the wine industry. In the last few months we have been able to adapt some existing course offerings to meet the Government's call for short courses to support upskilling by those whose employment has been affected by the coronavirus pandemic; we can readily do the same in response to industry needs or student or worker availability.

Another significant change in agriculture is the way farms are run. The operation of farms in Australia is increasingly more professional and more focused on efficient production. These are trends that require knowledge and skills beyond those traditionally required for farmers, a gap that they can bridge by acquiring or hiring the expertise. The end result for many farms could be a larger workforce with more disparate,

¹ <https://www.abs.gov.au/ausstats/abs@.nsf/mf/7121.0?OpenDocument>



specialised roles and more complex cost structures, requiring farmers or farm managers to extend their capabilities to include, for example, human resource management and financial management.

The National Agricultural Workforce Strategy will need to recognise the evolving skills requirements for future agriculture, as well as the need for continuing skills development. It will also need to ensure that the increasingly technological nature of farming – and the changing demographics noted above – are reflected in the way we promote and talk about agriculture careers.

The need for adaptability and resilience

Finally, another major theme in submissions and evidence to the House of Representatives Standing Committee on Agriculture and Water Resources inquiry is the need for adaptability and resilience in Australia's agricultural workforce and communities. This means adapting not only to a changing climate but to shifts in consumer preferences and global markets. There are clear advantages to Australia in positioning the country as a supplier not just of basic agricultural commodities but of premium products. This would require a larger and more specialised workforce, one that encompasses quality control, value add, marketing and export.

All these shifts will require new approaches to farm financing and risk management. Innovation in all forms – technological, systems and processes, financial and managerial – will be essential to the future agricultural workforce, and should be reflected in the strategy in a way that includes roles for universities and other training organisations, industry, professional bodies and governments at all levels.

Responses to selected Discussion questions

Effect of changes to agriculture and broader society

1. *During the next 10 years, what impact will the following changes to agricultural production, processing and distribution have on the workforce:*

a. *innovation and technological advancement, including robotics and Artificial Intelligence.*

Adoption of new technologies will lead to increased efficiencies and outputs in agricultural production, many of them linked to farmers' ability to manage variations in temperature and rainfall, as well the physical characteristics – geography, geology, soil – of their properties. This will mean an increased need for technically skilled agricultural workers.

b. *changes to agricultural production—for example, moves to high-value crops and produce, or structural adjustment.*

c. *changes in consumer demand—for example, end-to-end supply chain traceability as a development of the 'clean and green' brand, provenance and the use of more plant-based ingredients?*

Effective management, distribution and marketing of high-value crops and produce, and responding to consumer demand for more information about the food they consume will also require a highly-skilled workforce, with capabilities beyond those traditionally associated with agriculture.

This may lead to an increase in the agricultural workforce in regional areas, although some of the emerging roles will not require a workforce that is physically present in farming areas. As noted above, education and on-going professional development will be essential to ensuring that future agricultural workers – wherever they may be located – have the skills they need.



2. *What will be the effect if agriculture continues to trend towards supplying up-market, premium, and high quality produce, with increasing value-adding manufacturing?*

To paraphrase the Minister for Industry, Science and Technology, the Hon Karen Andrews MP, in her speech to the National Press Club on 20 May 2020, Australian agriculture, like many other industries, must be ready to compete on quality rather than price. In agriculture, this will mean some shift in output towards the supply of premium products with value-added elements – which could include assurances about the provenance of the product. Again, this is a goal that requires a technically skilled workforce.

3. *What impact will climate change and other environmental situations such as severe droughts, severe storms and long fire seasons have on the agricultural workforce?*

Australian farmers' ability to adapt to a changing climate has improved steadily, out of necessity – for example, the drought over recent years has not led to mass property sales like we have seen in the past, although this is also in part due to more effective government support.

That aside, the adoption of technologies like global positioning and smart sensors will promote more effective use of inputs and faster adaptation to changing conditions, as producers will be able to access real-time and localised information about conditions.

4. *What ways might changing social perceptions of different agricultural activities (for example, perceptions about sustainability, emissions, and animal welfare) affect the agricultural industry and its workforce?*

Agriculture as an industry needs to shape social perceptions of farming and food production, not just respond to them. By 'telling its own story' agriculture can correct misperceptions about sustainability, use of resources, animal welfare and other issues in ways that will also improve the appeal of agricultural careers.

5. *What impact will societal changes, such as the ageing workforce low unemployment, low immigration and relocation of regional population (and agricultural, health and education workers) to urban areas, have on the agricultural workforce?*

The House of Representatives Standing Committee on Agriculture and Water Resources has received submissions and evidence on this issue which suggests that the shift of population away from regional areas can be addressed in part through medium and long-term plans from State and Federal Governments, backed by investment. Lifestyle can be a major attraction, but it needs to be backed by the provision of the same kind and quality of services that populations can expect in metropolitan areas – especially in health care, a major concern for an ageing workforce. Ensuring they have similar educational and career opportunities as their metropolitan counterparts is also important.

Again, the increasing use of informational technology in agriculture can be a positive factor in attracting workers to regional areas: an agronomist, analyst or remote vehicle operator can as easily work from a regional town as they can on-farm. With effective planning by and support from governments, the towns themselves can become the hubs for value-adding, processing, packaging and distribution, providing employment opportunities across a range of higher-wage industries.

6. *What impact does the continuing international corporatisation of agriculture have on labour and jobs?*

International, corporate-owned farms tend to be larger, relying on economies of scale. This can lead to smaller workforces and a greater reliance on automation. While these trends might be welcome, a key concern must be that farms owned and operated by international corporations are run in line with Australian best practice in agricultural production and environmental management.

7. *What are key health and wellbeing considerations for the agricultural workforce?*



Farming as a profession is demanding, and the long and variable hours involved mean that many producers cannot seek medical advice even when it is available. There is abundant evidence of a health care gap between Australia's regional and metropolitan areas, evinced by higher incidence of chronic conditions and lower life expectancies, and the underlying problems are exacerbated by poor access to medical care, particularly specialist care.

Charles Sturt University can show that health care professionals trained in regional areas are more likely to remain in regional areas, and their familiarity with the region means they are better able to meet the health and well-being needs of the agricultural workforce. Increasing the number of health care professionals being trained at regional universities and hospitals is essential.

Availability of workers

8. *What are the key drivers that will influence the size and skill needs of the agricultural workforce in the next decade?*

There are three main drivers: knowing how to respond to a changing climate, knowing how to use new technologies, and knowing how to run agricultural production as a business. As noted above, these drivers may mean the size of the agricultural workforce could increase in specialised areas.

9. *What factors (e.g. status of the agricultural industry compared to other industries, competitive labour market, workplace conditions, public perceptions of agricultural jobs and industries) impact the pool of talent available to pursue agricultural careers? How can these factors be mitigated?*

The National Agricultural Workforce Strategy can be an important tool in changing perceptions of agriculture and increasing the appeal of agricultural careers, in part by showing how agriculture in Australia is changing – in its demographics, its use of technology, its use of natural resources and its impact on the environment.

A combination of a shift to premium products, more effective financial management (both leading to higher or at least more stable incomes), and government strategies and investment to develop regional areas, could mitigate, and even reverse, some of the factors that deter people from careers in agriculture.

10. *How can agribusinesses and related industries better attract workers? What factors affect entry into the agricultural workforce? How can the agricultural industry achieve greater exposure? Why do people leave the agricultural workforce? How can these factors be mitigated?*

Addressed above. Charles Sturt University would also like to note the value of highlighting Australian agriculture's successes, rather than focusing on droughts and other challenges. Better awareness of farmers' successes in land management, remediation, exports, adapting to market shifts or in developing or adopting technology would help the profession become more attractive.

11. *What are the implications if the supply of skilled agricultural workers is insufficient for your sector or business?*

For Charles Sturt, the main challenges are persistently low demand for agricultural courses coupled with falling government funding. A Deloitte Access Economics report on 'Transparency in Higher Education Expenditure'², commissioned by the then Department of Education and released in November 2019, showed that the cost-to-funding ratio for courses in Agriculture, Environmental and Related Studies had fallen from 97% to 87% over 2015-18, making these courses increasingly expensive for universities to provide. The economic shock resulting from the coronavirus pandemic has only exacerbated these

² https://docs.education.gov.au/system/files/doc/other/transparency_in_higher_education_expenditure_2019_final_report.pdf



problems, and cost pressures may yet lead to the closure of some agriculture courses, further reducing the supply of graduates.

In response to these challenges Charles Sturt has recently launched 'Sustainable Futures', a transformation program designed to reshape and reposition the University so that we can continue to deliver excellence in education and research. The program will build on our strengths in areas like Agricultural Science, Veterinary Science, Farm Production, Horticulture, and Viticulture, among others, and ensure our future is financially and academically sustainable. Only by doing so can we maintain our central role in meeting the knowledge and skills needs of Australia's agricultural workforce.

Skills and Knowledge

12. What skills and knowledge does the agricultural workforce need in the foreseeable future to ensure the ongoing productivity of the agricultural industry given the changes the industry and Australia is experiencing?

As noted above (Question 8), the key knowledge and skills for the future agricultural workforce are those associated with responding to changing environmental conditions, using technology effectively, and financial management.

13. Is the current education and training system for agricultural workers fit for purpose? Are the needs of the agribusiness workforce adequately served by current education and training systems (high school programs, vocational education and training, and higher education)? What is working? What is not? How can these systems best meet the needs of the agricultural workforce? What changes might be required to accommodate the different learning style of younger generations of people?

Charles Sturt University notes that there are multiple reviews of vocational education and training under way or about to be launched in Australia, not including any changes to the system in the wake of the Prime Minister's speech to the National Press Club on 26 May 2020. The increased focus on the VET system has some implications for the Strategy.

Through our links with regional producers we are aware of the challenges many farms face in recruiting on-farm workers with the appropriate practical skills, a gap that could be addressed through the VET system. As a university our concern is degree level education, particularly professional education, and research.

A key challenge in both education and research is funding, for the institution and the student. A recent analysis by Andrew Norton of ANU³, drawing on the Deloitte Access Economics report mentioned above, shows that agricultural and veterinary science programs are essentially 'break even' for universities, since they have a high cost of provision not matched by Commonwealth funding. An even greater disparity exists in relation to agriculture research, a problem exacerbated by a research funding system biased in favour of large metropolitan universities. Without increased funding for agriculture education and research, especially in regional areas, universities may not be able to meet the needs of the agricultural workforce either in terms of the supply of graduates or the provision of new knowledge.

The costs to students are also high, especially if they want to develop their knowledge and skills beyond an undergraduate degree: a farmer, sole trader or someone working in a small business in the wider agricultural sector is unlikely to be able to afford a Masters program, or persuade their employer to cover the cost.

³ <https://andrewnorton.net.au/2020/05/20/university-domestic-bachelor-degree-student-profits-and-losses-by-field-of-education/>



Upskilling or even maintaining the skills of our agricultural workforce will require a variety of pathways into technical and higher education, a greater variety of education options including microcredentials, and funding arrangements to make education and skills development viable for both students and providers.

14. *What skills and knowledge do business owners need and how can this be best achieved (formal education or informal education and different modes of delivery, for example micro-credentials, online learning, workplace learning)?*

As noted above, one immediate challenge for the agricultural workforce is in ensuring farmers and farm managers have the requisite business skills. Upskilling the existing workforce would best involve a combination of certified microcredentials and online delivery, ensuring that people can acquire the knowledge and skills they need quickly, at relatively low cost and without too much time away from the business of farming.

Opportunities, best practice and priorities

20. *What should be done in the short (1 year), medium (2 to 3 years) and long term (5 to 10 years) to improve the productivity and resilience of the agribusiness workforce?*

In the short term, governments and the agricultural industry can take steps to ensure that agriculture education programs are appropriately funded, by providing support for both students and providers. This should be accompanied by initiatives to increase the number of students choosing to study agriculture and related fields, in part through measures to change perceptions about agricultural careers.

Over the medium term, governments at all levels can work with the industry to develop the equivalent of an apprenticeship model for farm workers, delivered through the VET system, and encourage up-skilling of the existing workforce through the development of microcredentials and flexible post-graduate programs.

