

# University of Melbourne *Green Paper on Agricultural Competitiveness* submission

December 2014

## 1. Introduction

The University of Melbourne is delighted to offer a submission to the consultation on the *Green Paper on Agricultural Competitiveness*. This submission makes a number of recommendations in support of a system where Australia can leverage strong returns from agricultural education and research through immediate opportunities, as well as ensuring Australia continues to invest for the long-term. The opportunities that agricultural education and research offers now, alongside future investment, are central to the nation's economic, social and environmental progress.

In addition, the submission draws on the University's extensive capabilities in bioscience, engineering, veterinary and agricultural sciences, management and economics to make specific policy recommendations on several themes of the Green Paper including drought, biosecurity, water and natural resource management.

## Education and Research

The following sections offer specific recommendations on education and research as they relate to agriculture and the discussion around them in the Green Paper.

## 2. Education, skills and training, and the labour force

### *Recommendations*

- Introduce a dedicated program of research training scholarships or stipends, tailored to each state, so more students are attracted to agricultural research.
- Support current and future partnerships between universities and industry, and initiatives that improve the relationships and collaborations between all stakeholders to ensure training and education meets current and future skilled workforce needs and priorities, rather than ad-hoc arrangements.

- Develop an initiative to identify the skilled workforce needs and priorities specific to the agricultural workforce.
- Government can support partnerships through incentives for the private sector to engage with universities via academic appointments, undergraduate scholarships, research scholarship stipend top-ups, work experience, and research investment.
- Clarify the role of the States, the Commonwealth, industry, and research organisations in supporting Australia's agricultural research effort.
- Develop educational partnerships and collaborative centres of excellence to serve the needs of broad agricultural regions. Their activities can have the breadth to be able to address not only scientific and technical challenges, but also those related socioeconomic issues that are faced by agricultural regions. Partnerships would engage different institutions and levels of education, secondary, vocational and higher education as appropriate.

***Rationale: Higher education and agriculture***

Higher education is important for the future prosperity of Australian agriculture. Although not a large focus in the Green paper, graduate outcomes are critical for human capacity building more broadly, with a specific focus on underpinning innovation in the agriculture sector.

One challenge is to support the promotion of tertiary agricultural courses through a national approach to increase awareness of career pathways. A second challenge is to ensure the wide availability of a science-based curriculum in agriculture at undergraduate and graduate levels.

Masters and PhD graduate programs are required in order to develop advanced graduate outcomes in agriculture. Availability of higher degree programs is vital so that graduates already employed in the agri-food sector are able to update and improve their skills and knowledge. For example, the University of Melbourne has a strong coursework Master degree program (Master of Agricultural Sciences) allowing specialisation across agribusiness, animal science, and food science.

Skills sets required of professional services for agriculture are becoming increasingly complex in areas such as responses to climate variability, productivity imperatives as

part of a global trading environment, innovation strategy, technology uptake in agricultural systems, different paradigms for managing agricultural production (for example larger farms, corporate family enterprises), foreign investment and community responses to agricultural opportunities.

Whilst agriculture is a global game, production systems and the challenges facing the agricultural industries have a distinct local flavour. To ensure flexibility and fit for purpose programs, a distinct suite of initiatives within each State are important. This includes some level of dialogue between the providers who may be in either complementary or competing roles.

Centres of excellence that can serve broad agricultural regions are critical. Often the components are spread thinly across the landscape and this limits the effectiveness of the services and outcomes and often makes it difficult to attract staff. Co-location of business, university and community infrastructure provides synergistic opportunities and a critical mass of professionals to serve regions where the issues occur.

It should be noted that in Table 3 in the Green Paper (page 55) Victoria is not represented, potentially suggesting that there are no schools that "identify as agricultural schools" in Victoria. This may appear so but many Victorian schools in fact have agriculture strongly embedded in their curriculum and are connected with local agricultural industries.

### **3. Research, development and extension**

#### ***Recommendations***

- Greater coordination between the Rural Development Corporations (RDCs), Australian Centre for International Agricultural Research (ACIAR), CSIRO and State governments and university and research organisations. This will produce synergies in knowledge production.
- Recognise the contribution of the National Primary Industries Research Development and Extension Framework. There is also the need to go further to ensure greater coordination and collaboration in research, and the strongest impact and commercial returns for agricultural research.

- Maintain the current focus of the research block grants as critical to Australia's research effort.
- Develop a program of incentives for careers in research to meet industry needs. This could usefully occur through facilitating Small and Medium Enterprise's (SMEs) access to university research & development (R&D) capability through provision of seed funds from government.

### ***Research block grant and extension activities***

The Green paper notes on page 84 that,

“Stakeholders also suggested amending research block grants under the Government's research performance funding, arguing that the balance of incentives had not encouraged universities to undertake some activities, such as providing extension services. In its current form, the allocation of RD&E funding to universities is weighted towards academic incentives, such as publications, rather than practical application by industry.”

Although the full cost of publicly funded research is not met by Government, the research block grants are the primary mechanism by which the essential indirect costs of research are met. They are not a genuinely flexible pool of funds that can be redirected without consequence. Research block grants are critical to supporting the research effort, playing a vital role in assisting research organisations to meet indirect costs, even when industry partners are involved.

The University of Melbourne notes the strong support for continued agricultural RD & E and for the RDC system of research funding, including the levy scheme.

The Green Paper recognises that research funding arrangements provide for “greater incentives for collaboration between research and industry and the need to develop world-class research infrastructure to attract international researchers”. This is particularly pertinent for universities and the high quality researchers that come through Masters and PhD programs.

Despite concerns about the future role and capacity of agricultural extension and that the outcome will affect the take-up of R&D and limit productivity gains, it is important to note that Australia has a unique public-private extension system when considered

globally. It is not necessarily the role of universities to provide extension services outside collaborations.

Extension plays an important function in Australia's agricultural innovation system – operating as a feedback loop to research and assisting in the translation of research into commercial use. In this way there are both public and private good characteristics of the extension function. The Australasia-Pacific extension network (APEN) coordinates a national perspective on education offerings for future extension professionals.

It is important to support incentives for universities to participate (in partnership with industry/other RDE organisations) in the extension function. The University sector has three roles in agricultural extension:

1. Educate and train future agricultural extension workers and people in the RD&E system (for example researchers) in extension theory, professional practice and skills (including private sector, not for profit sector, public). This should be further supported by undergraduate scholarships to specialise in extension education.
2. Active participation in extension – in concert with other organisations (public and private).
3. Undertaking R&D in novel and redefined extension methodology in collaboration with public and private entities.

For example, the University of Melbourne provides extension education for undergraduate and graduate students. The University of Melbourne hosts an extension research group (Rural Innovation Research Group) within the Faculty of Veterinary and Agricultural science funded by agricultural industries (RDCs) and some government groups.

However, resourcing is limited and scholarships which target agricultural extension and research career development are required, along with resources for agricultural extension by academic researchers (in partnership with industry).

## **Other topics from the Green Paper**

The following sections focus on several themes of the Green Paper including drought, biosecurity, water and natural resource management issues. These are key areas

where Government, university and industry need to collaborate to achieve strong outcomes for Australia.

## 4. Water and natural resource management

### *Recommendations*

- Provide information and extension support to farmers and other irrigators to continually develop their 'literacy' in water markets and water management as a part of sustainable business management.
- Develop a range of education and training services and products related to water management for irrigators that address: basic water market 'literacy' (for example regulations, trading); sustainable water management techniques (for example precision agriculture); water conservation and agricultural management practices (for example alternative fodder crops, irrigation technologies).
- Establish a cross-industry agricultural water resource management taskforce to identify priorities and risks for future sustainable water use in agriculture.
- Undertake reforms and capacity building to enable trade between agriculture and the environment to capture benefits for both sectors. This is likely to involve trading of annual allocation between sectors. Governance to ensure transparency will be critical given the potential for large entitlement holders (for example environmental water holders) to influence prices.
- Ensure that water utilities adopt efficient and effective business practices and charging models that ensure infrastructure maintenance and renewal occurs and is funded. This is particularly important for modernized infrastructure systems that will have shorter life spans and greater maintenance requirements than traditional systems.
- Develop and invest in a comprehensive national research and development strategy for agricultural water productivity that supports innovation in integrated water use and 'doing more with less' (for example conjunctive use of irrigation and environmental water; 'smart' river control; opportunistic cropping in variable rainfall zones).

## ***Drought***

With the likelihood of increasing climate variability and extreme events, responses to a range of threats will require an integrated and broad approach involving government, private industry, and communities. Drought policy must account for post-drought or post-event capacities and also ensure strong links to industry and value chain as collaborators in responses.

In recent years there have been many inquiries, research projects and pilot projects across the country related to drought policy and industry needs, particularly associated with the millennium drought. To date, the results of these have not resulted in adequate new policies.

Whole of government policies are needed, in particular those policies related to workforce and skills, community infrastructure and industry partnerships. Specific initiatives should emphasise community preparedness for drought.

Severe droughts increase the importance of adaptive capacity at an individual farm, sector and community level. For instance, when the Millennium Drought impacted the lower-Murray darling basin, several areas such as business planning, social policy, mental health, industry RD&E, all came together to support adaptation and restructuring. However, when the water 'came back', severe workforce shortages and a more efficient production sector meant the ability to respond to favourable conditions was severely constrained.

## ***Resource management***

The University supports a greater emphasis (than currently provided in the Green Paper) on policies that encourage greater integration of natural resources management initiatives into agricultural programs. This recognises the impact of past agricultural land-use on biodiversity and the need to maintain and build on biodiversity conservation accomplishments.

Natural resources management initiatives are not adequately represented in the green paper, with less than a page. Regarding the Environmental Protection and Biodiversity Conservation Act 1999, we question the observation that there are excessive caveats regarding flora and fauna. Australia's biodiversity has been significantly impacted by agricultural land use. Flowing from this there needs to be a wider national discussion around the need for corridors for transport needs to be balanced with the need for flora and fauna corridors. This would also be a good

opportunity for a national discussion also around targeted pest and disease management and control.

Disease challenges are complex and require special expertise and techniques to detect, investigate, understand and manage (epidemiology). Since 2008 Wildlife Disease Surveillance Victoria, based at the Faculty of Veterinary and Agricultural Sciences at the University of Melbourne has made over 100 investigations annually into the mortality and morbidity in free ranging wildlife (mammals, birds, reptiles and amphibians) across Victoria. Another example of very productive collaboration is where partnerships report into Australia's national wildlife health data base combining university expertise (outreach, engagement, extension) with the Victorian public, farmers, Landcare, catchment management authorities, wildlife carers, veterinary practitioners, the Victorian government, Parks Victoria, bird observers, and field naturalists.

Knowledge of baseline wildlife health and disease is important for domestic animal and human health, biosecurity (cross-over with biosecurity policy). University veterinary faculties providing national wildlife disease surveillance is the model used by Canada (Canadian Cooperative Wildlife Health Center) and is considered the best program internationally.

## 5. Biosecurity and improving the biosecurity system

*The University of Melbourne supports a robust biosecurity system that is risk-based and protects Australia's animal and plant health status. The Commonwealth and State governments, universities, industry, the CSIRO and other researcher organisations all have an important role in biosecurity. However, more can be done to protect Australia's biosecurity into the future.*

### **Recommendations:**

- Expand biosecurity policies to include research and development activities to address biosecurity risks. This should include on shore risks to agricultural and animal industries from 'spill over' of domestic animal diseases into wildlife populations, creating an ongoing wildlife reservoir of disease that is near impossible to control or manage and long-term threats to animal industries.
- Help Australia's neighbours to remain (or become) disease-free by improving biosecurity outside of our borders and help control key diseases in areas from

which there are major exchanges of products and/or people. Particularly for disease such as avian influenza, this can be transmitted by naturally migrating species.

- Support increased coordination and participation between Australian states in relation to tracking systems. These might include livestock traceability systems (in particular for pigs, sheep and goats) and IT systems for animal health surveillance to ensure a national animal health surveillance system capable of handling multi-jurisdictional outbreaks.
- Investment in building future high-level skills and expertise to *lead* the next large-scale emergency animal disease event. This will require both technical and managerial skills. For example,
  - Maintain the *Australian Veterinary Reserve*.
  - Refresh the *Rapid Response Team* capacity.
  - Support private veterinarians in updating emergency animal disease management and communications skills.
- Better targeting of biosecurity RD&E effort around key university-based centres, for example veterinary epidemiology, plant pathology and public health in Australia. Particularly key technical areas of national importance include:
  - infectious disease modelling to inform plant and animal health policy;
  - diagnostic test validation in the absence of gold standards (i.e. particularly when faced with novel, emerging and re-emerging infectious agents for which validated diagnostic tools do not yet exist);
  - bioinformatics and biostatistics to inform animal health policy; and
  - evidence-based medicine and best practice with respect to antimicrobial resistance stewardship.

For example, the Centre of Excellence for Biosecurity Risk Analysis at the University of Melbourne conducts research into surveillance, effective inspection systems, data mining, methods for treating uncertainty in risk analysis, electronic monitoring of open source information to detect emerging

threats, emergency preparedness, epidemiology, spatial modelling of invasion processes, improved methods for expert judgement and benefit-cost analysis of biosecurity systems.