ATSE Submission: Agricultural Competitiveness Green Paper

The Australian Academy of Technological Sciences and Engineering (ATSE) welcomes this opportunity to provide input to the Government’s Agricultural Competitiveness Green Paper.

ATSE advocates for a future in which technological sciences, engineering and innovation contribute significantly to Australia’s social, economic and environmental wellbeing. The Academy is empowered in its mission by some 800 Fellows drawn from industry, academia, research institutes and government, who represent the brightest and the best in technological sciences and engineering in Australia. The Academy provides robust, independent and trusted evidence-based advice on technological issues of national importance. ATSE fosters national and international collaboration and encourages technology transfer for economic, social and environmental benefit.

Summary:
ATSE considers that the competitiveness of Australia’s agriculture and food sectors relies, more than ever, on strong and stable support for science, research and development, translated to economic impact through various extension mechanisms.

To meet the future challenges facing this sector while building the capabilities to seize emerging opportunities requires a long-term strategic vision and national plan, with buy-in from State and Commonwealth governments and producer associations. Such a strategy must take into account four key factors: increased agricultural and food industry productivity – particularly the rate of productivity improvement pre-farm gate; responsible natural resource and ecosystem management; targeting high-value, high-quality products and value-add opportunities for emerging international markets; and maintaining Australia’s strong biosecurity system.

This submission addresses below both the Green Paper’s identified policy principles and categories for policy ideas, as described in Figures 1 and 10. In particular, ATSE specifically addresses a number of issues related to the policy categories ‘Working with the States and Territories’, ‘Education, skills and training, and labour’, ‘Water and natural resource management’, ‘Research, development and extension’, ‘Biosecurity’, and ‘Accessing international markets’.

Introduction:
Agriculture plays an important role in Australia’s economic and social fabric, and is a key pillar of the Australian economy. Enhanced agricultural production and development will ensure strong, vigorous and competitive Australian agriculture and food sectors. This will require increasing both output volume and value, through better value adding of primary products and transformation of waste streams, targeting emerging markets for premium products, particularly in Asia, and emphasising our reputation for high quality, clean, safe and sustainable produce.

Australia is a major international trader of agricultural commodities, and one of only a few net exporting nations. While the volume of Australia’s agricultural and food exports will never feed the world, the growing issue of global food security requires continued, robust
international trade of food through agricultural commodities and products. Australia's agricultural sector will continue to have an important role to play in this regard.

Increasing output and seizing emerging market opportunities means sustainably adding value, effectively producing 'more food with less'. Key to this is the simultaneous increase of overall productivity and responsible natural resource and ecosystem management. The successful development of sustainably intensified production and processing systems in Australia will require innovative approaches arising from targeted research and development, and the strong participation and ingenuity of agriculturalists and agribusiness investors underpinned by a cohesive policy framework.

Through ecologically responsible intensification married with a strategy targeting high quality and high value outputs, innovative agrifood businesses will reap the rewards from increasing global market opportunities while building resilience for future challenges.

**Agricultural Research, Development, and Extension:**
Australian agriculture is reliant on innovation-driven productivity improvements to increase production and remain competitive. Significantly greater improvements to productivity than have been achieved in recent years will be required to underpin future competitiveness. This will require a strong agricultural and food innovation system, with ongoing investment from industry and governments.

Historically, improvements in productivity and output of Australian agriculture have been underpinned by fundamental science, research and development (R&D), and extension. Investment in these essential areas has stalled over recent decades, and the slowdown in total-factor productivity growth in Australian agriculture (even when corrected for drought) has been attributed to the decline in public R&D investment.

Most importantly, the time lag between research expenditure and farm benefit is often very long – in the order of 20 years. Agricultural research is not a tap that can be turned on and off with the expectation of immediate responses; it is usually a very long term investment, but with very high returns. Models for funding research must deliberately take this into account if the maximum value for research is to be realised.

While research and innovations that can be immediately applied on-farm are important, we must not fail to recognise the role of strategic, fundamental research which underpins these advances, and the associated, inevitable time lags involved. The priority for public research funding should be to ensure high quality, continuous effort on the issues which will make a difference – in contrast to the often fragmented and discontinuous nature of current public research funding. Better continuity of research funding would also help to attract and retain the highest calibre researchers to this sector.

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Australia’s Rural Development Corporations (RDCs) have played and will continue to play a vital role in pulling together the various research suppliers in Australia, leading to a generally efficient, coordinated and rationalised national approach to agricultural R&D challenges. However, it is critical to realise that this system relies on the fundamental and strategic research undertaken in universities and national agencies such as the CSIRO.

Further to this, while the RDCs play a crucial role in translating agricultural research to economic benefits, cross-sectional research often does not fit effectively within this structure. The other major research system in Australia which does fill this role is the Cooperative Research Centres (CRC) program. CRCs bring together RDCs, universities, national research agencies and industry to address targeted issues with a focus on end users. Agricultural and food-focused CRCs have, and continue to, produce significant benefits, as illustrated by the Allen Consulting Group’s 2012 review of the CRC program. In addition, these collaborative research programs play a significant role in fostering a continuing supply of high quality researchers in the agriculture and food sectors, while also building professional R&D capability in businesses and industry throughout the value chain.

Central issues raised in the Agricultural Competitiveness Green Paper rely on our scientific and research infrastructure to be addressed, including: adapting to increasing droughts and other consequences of climate change; adding value to primary produce before export; natural resource management, including water, soil, and nutrients; competing land-use needs; maintaining biosecurity; and improving farm productivity and competitiveness through technological innovation.

The levels of public and private investment in agricultural research, development and extension must be part of the discussion around improving the competitiveness of Australia’s food and agriculture sectors. At current levels, it will be very difficult to meet the coming challenges and seize emerging opportunities. To get the maximum benefit from our investment in science and research, translation and extension mechanisms also require appropriate investment to achieve impact.

Vision and strategy:
As described above, Australia’s food and agriculture sectors are facing considerable risks to their sustainability, through increasing pressure on natural resources and competition from other sectors, but are also seeing the emergence of a range of new market opportunities, particularly through demand from Asia’s growing middle class – as illustrated through modelling by the Australian Bureau of Agricultural and Resource Economics and Sciences. The future profitability and competitiveness of these sectors depends on developments across a wide range of interrelated areas. Success will depend on a long-term national vision and strategic plan to focus and direct the sustainable growth of agriculture and food export industries.

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3 ABARES 2013, What Asia wants: Long-term food consumption trends in Asia, ABARES Research report, Canberra.
It is not enough for the Commonwealth to pursue a disconnected list of policies proposed by various stakeholders across the diverse industries that make up these important economic sectors. Rather, the future of Australian agriculture depends on a coherent and cohesive policy framework informed by and accountable to a holistic vision comprising goals that play to our strengths, appropriate targets to be met – including specific production, export, and environment oriented targets – and pathways to achieving these based on the best science available. Cooperation and alignment between State and Commonwealth governments and institutions, as well as industry itself, is essential to developing a credible vision and strategy on these terms, and to delivering its outcomes effectively.

The basis of such a strategy should be four-fold, specifically:

- **Increased agricultural and food industry productivity – particularly in the rate of productivity improvement pre-farm gate.** This is essential for ongoing profitability by reducing input costs, such as fertilisers, chemicals, and transport, and transforming waste streams where possible to improve efficiency. A productivity focus also has the potential to improve environmental sustainability and resilience, through better water-use efficiency, limiting additional land requirements, and natural resource management issues.

- **Responsible natural resource and ecosystem management.** Increased competition from other sectors, including minerals and energy extraction, and urbanisation, as well as environmental degradation and changing climates, will place ever greater pressures on the availability of natural resources such as water, soil, land, and nutrients. Preserving the health of our ecosystems through responsible management will help to protect these essential resources and ensure their continued availability for Australia’s agriculture sector. This must be based on good scientific understanding of these fundamental systems, while helping farmers to maintain their profitability.

- **Targeting high-value, high-quality products and value-add opportunities for emerging international markets.** The projected growth of Asia’s middle class will present huge opportunities for Australia’s agriculture and food sectors – particularly building on our reputation for clean, safe, sustainable, and high-quality products. Growing demand for prestige products, such as wine, dairy, and meat, will present greater profit potential than competing on cost for bulk commodities. Investment in research to understand consumer preferences in target international markets will also improve the targeting of potential opportunities.

- **Maintaining our strong biosecurity system.** Australia’s commitment to both exotic and endemic plant and animal biosecurity, as well as a world’s best regulatory framework, is crucial to protecting agricultural production and the environment, while maintaining the utmost confidence of international customers in our products. Australia’s favourable biosecurity status enables access to important target markets in Asia and around the world, and threats to this status from incursions of pests, diseases, and exotic flora and fauna will only increase over coming decades.

Science, research and technology are fundamental to addressing these issues.
The development and delivery of novel technologies can offer benefits such as improved resource use efficiency, more reliable yield, enhanced food functionality and nutrition, while improved biosecurity outcomes can flow from research delivering pest and disease resistance, enhanced surveillance and detection, and capacity for more rapid response to incursions of exotic threats.

Research into ecosystem carrying capacities and groundwater dynamics can ensure more effective and sustainable use of water resources while avoiding conflicts between resource users. Much of the Australian continent used for agriculture has a highly variable climate with respect to both rainfall and temperature and there is evidence that this variability is increasing. Accordingly, the reliability of our agricultural production and competitiveness in overseas markets will increasingly rely on better water management and trading informed by cutting edge forecasting and understanding of our interconnected hydrological systems.

Innovative processing techniques and technologies can turn waste streams into valuable products in their own right, increasing profitability and efficiency. Further, there is great potential for research to improve the overall quality of Australia’s agricultural produce and reduce variability.

Better data tools for tracking and monitoring crops and animals, known as ‘paddock to plate’, can reduce regulatory costs and enhance product value by providing a comprehensive history of every animal’s life.

To take advantage of opportunities for expansion of tropical agriculture, Australia will need research into better adapted crops and production technologies for commercial application. The relative lack of research, development and extension capacity for production agriculture located in the tropics will hold back the potential for greater agricultural development in northern Australia.

Research also has an important role to play in informing a strong regulatory framework in agriculture and food. Pursuing evidence-based regulatory practices underpinned by high-quality science and research and based on desired outcomes can encourage innovation while maintaining the integrity of Australia’s integral biosecurity, food safety, consumer protection and environmental protection frameworks.

Concluding remarks:

Australia’s agriculture and food sectors are important contributors to the economy, but are also highly diverse and fragmented. To best meet the challenges of the coming decades while taking advantage of emerging opportunities will require vision and leadership at a national level, with a long-term strategic plan for implementation. To be effective, this must involve cooperation between all levels of government and buy-in from producer associations in particular. Comprehensive consultation with the diverse industries that make up this sector is crucial to achieving this.

A major issue in this area that also requires significant attention is education and training, which is addressed in the Green Paper. The suggested policy idea of developing national agricultural centres of teaching excellence, including research and extension, is worthy of serious consideration.
Consistent with ATSE’s previous submission to the *Agricultural Competitiveness Issues Paper*, the following recommendations derived from the report *Food and Fibre: Australia’s Opportunities* remain relevant.

ATSE considers that the competitiveness, profitability, and future growth of Australia’s agricultural and food sectors will depend on:

- The development and implementation of a long-term vision and strategic plan to focus and direct the sustainable growth of agrifood and fibre export industries;
- Leveraging the provenance, enhanced specifications, and increased value-add of Australian agricultural and food produce to demand a premium position in local and export markets;
- Investing in Australia’s innovative capacity by industry and governments to support the knowledge creation, technological innovation, and skills-base required to improve productivity and sustainability, as well as investing in the translation of research, knowledge and technology to impact through extension and other mechanisms; and
- Building collaborative networks connecting research organisations, industries, and Australian and international agrifood businesses, to enable better development of new technologies and access to cutting-edge research.

Effective implementation of each of these recommendations depends on having the input of top Australian scientists into the development of policies and research priorities.

ATSE’s Agriculture Forum, comprising approximately 130 experts in food and agriculture research and industry, continues to develop Action Statements on critical issues to the future of Australian agriculture. The Forum would be pleased to make available its expertise on any of the issues raised here in the future.

For more information, please contact Dr Andrew Hastings (ATSE Research and Policy Officer) on (03) 9864 0909 or via email at Andrew.Hastings@atse.org.au.

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