

## **Submission to the House of Representatives Agriculture and Industry Committee Inquiry into agricultural innovation**

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### **Introduction**

On 13 August 2015 the Minister for Agriculture the hon Barnaby Joyce referred to the House of Representatives Agriculture and Industry Committee an inquiry into agricultural innovation. The deadline for submissions to the committee is 25 September 2015.

### **Background**

The Australian grape and wine industry has grown and prospered through innovation and strong leadership for well over 50 years. Generations of winemakers have entered the industry striving to understand what elements are required to produce wine with the characteristics they and their customers want to drink and, importantly, are prepared to pay for and then how to put that knowledge into practice. Industry has used two processes to drive this innovation – through the provision of new knowledge from research and through industry-led and directed activity. Innovation is driven by the people and companies that make up the Australian wine industry, either individually or collaboratively, and it uses information from a wide variety of sources, such as in-house research and technical activity, publicly-funded research including through our many universities and CSIRO, extension and education, suppliers to the industry, private companies and consulting organisations and the Australian Wine Research Institute (AWRI).

Research and development in the wine industry is undertaken by a large number of organisations. The primary stakeholders however are industry (grape growers and winemakers) and governments (Australian and State jurisdictions). Both groups invest directly into R&D as well as jointly, through organisations such as the Australian Grape and Wine Authority (formerly Grape and Wine Research and Development Corporation) and research providers. However, research providers and funders also have high vested interests in the R&D process. Efficiency in funding and provision of research outcomes are essential to ensuring scarce resources are put to the right projects and not fritted away and outcomes have real benefit in the field. Coordination of this complex structure is through the National Primary Industries Research, Development & Extension (RD&E) Framework Wine Sector Strategy (PISC Strategy). From an industry perspective, it is important we have the necessary structures in place to initiate, fund, research and deliver R&D outcomes with minimal duplication and maximum results.

The capacity to innovate does not just provide industry with the resources and knowledge to do more with less or come up with new and more cost-effective ways of doing things. Innovation also stands to improve resilience and the ability to

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overcome external challenges – be they climatic, consumer or economic – and come out the other side with improved returns on investment and increased profitability.

Effective research depends on several factors:

- Capability in research organisations;
- Adequate funding;
- Focused research priorities; and
- Capacity and desire to adopt R&D and put into practice.

Australia is fortunate in that we have world-class researchers working in many disciplines that can be applied to the Grape and Wine Sector. These hubs include AWRI, CSIRO, NWGIC and many of our universities. However, capability of research organisations to meet industry's needs also depends on the continued availability of funding. The industry-owned AWRI is particularly important in this regard.

Much of the funding for Grape and Wine Sector R&D is disbursed through AGWA and comes from a levy of \$2 per tonne of grapes delivered and \$5 per tonne of grapes crushed, matched by the Australian Government (up to 0.5% of the Gross Value of Production). The total fluctuates with the harvest but is around \$25 million per annum with \$40 million in project partnerships. Research providers through State and National investment also provide funds.

In addition to the monies spent in this collaborative sense, many of our wine companies (both small and large) are active in the research space with their own departments or individuals working on their own unique value proposition. In real terms, funding is declining and the levy system itself is always under threat as a cost-saving mechanism for Australian Governments.

WFA is of course very active in defending the current system and we are committed to ensuring the Australian Grape and Wine Authority retains its focus on research funding and maintains investment of research levies for research activities.

Concerns about maintaining our research ability stem from the fact there's been a critical decline in viticulture capability in our research institutions and State Governments significantly pulling out of publically-funded agricultural extension in recent years. On top of these pressures, AGWA's pool of research funding which is based on the levies collected has also been affected by market conditions. The end result is there's less money going into R&D to fund key research agencies and research projects, while the costs of doing this work continues to rise.

To help stay our course, we have the National Wine Strategy Implementation Committee in place which is chaired by the Winemakers' Federation of Australia. The committee is responsible for the development and implementation of a national strategy to ensure wine's RD&E is responsive to industry needs, meets government requirements and is both efficient and effective.

This strategy is collaboration between the Australian and State governments and industry and it was developed to build upon the existing wine RD&E collaborative arrangements so they met the requirements of the national RD&E Framework. The

strategy has established a process to achieve a set of agreed outcomes. Having it in place will help ensure - we maintain R&D capability and capacity; industry continues to be in the driver's seat, and; there's effective allocation of resources for future R&D work.

High quality R&D is only as good as the ability to adopt the findings and improve industry's performance and long-term viability. Our shared challenge then is to ensure industry has a plan for its future including an integrated vision in place to guide AGWA and deliver our research priorities and that we are ready, willing and able to embrace the positive changes possible thanks to our ongoing investment in R&D.

### **Who we are**

The Winemakers' Federation of Australia (WFA) is the national peak body for Australia's winemakers.

Our objectives are:

- to represent the interests of Australian winemakers and grape growers of all sizes on national and international issues affecting the Australian Wine Sector, through a single organisation;
- to actively promote and protect the reputation and success of Australian Wine and the Australian Wine Sector;
- to encourage unanimity of opinion and action amongst Members in all national and international matters pertaining to the Australian Wine Sector;
- to initiate legislative or other regulatory activity, or Government response or action, or otherwise facilitate any outcomes, deemed desirable by the Association for the benefit of the Wine Sector in Australia;
- to provide a medium through which opinions of Members may be ascertained or expressed;
- to provide relevant information to Members;
- to foster co-operation and goodwill between viticultural and oenological research and education bodies and all other bodies relevant to the Australian Wine Sector
- to encourage good practice and standards of winemaking and Wine business management within the Australian Wine Sector;
- to administer funds collected from Members in support of the activities and objects of the Association;
- to protect and enhance community and Government support for the Australian Wine Sector;
- to promote economic, environmental and social responsibility in the production and consumption of wine in Australia; and
- to promote the interests of the Association and to do all such other lawful things as the Association may consider incidental or conducive to the attainment or advancement of the objects of the Association.

Government recognition of WFA as a representative organisation is on the basis WFA represents the entire Australian winemaking sector, including members and non-members. WFA is recognised as a representative organisation under the *Australian Grape and Wine Authority (AGWA) Corporation Act*. WFA is incorporated under the *SA Associations Incorporation Act 1985*.

WFA membership represents around 80% of the national wine grape crush and has over 370 wineries as members.

WFA represents small, medium and large winemakers from across the country's wine-making regions, with each having a voice at the Board level. WFA Board decisions require 80% support so no one sector can dominate the decision-making process. In practice, most decisions are determined by consensus.

WFA works in partnership with the Australian Government and our sister organisation, Wine Grape Growers Australia (WGGA), to develop and implement policy that is in the wine sector's best interests.

WFA's activities are centred on providing leadership, strategy, advocacy and support that serves the Australian wine industry now and into the future.

### **Issues**

The Terms of Reference for this inquiry centre on the use of new and emerging technologies to increase agricultural productivity. The inquiry will have particular regard to:

- improvements in the efficiency of agricultural practices due to new technology, and the scope for further improvements;
- emerging technology relevant to the agricultural sector, in areas including but not limited to telecommunications, remote monitoring and drones, plant genomics, and agricultural chemicals; and
- barriers to the adoption of emerging technology.

Agriculture productivity in the wine sector is more complex than an increase in a unit of production for a set quantity of inputs. Agricultural productivity in the wine sector refers directly to the ability to produce grape and wine according to a set group of target specifications while minimising input cost of inputs.

### Grape and Wine Biotechnology

Techniques such as whole-genome sequencing and systems biology are revolutionising winemaking by combining the ability to engineer phenotypes rationally, with an understanding of the genetic make-up and key phenotypic drivers of key organisms (Borneman, Schmidt and Pretorius (2013)).

Despite the demonstrated ability of genetic modification (GM) of grape vines and microorganisms to dramatically improve wine production and reduce input costs, the technology remains largely unused due to bans on its application in most major wine-producing countries. Even, in countries like Australia, where, for example,

GM produced yeasts could be approved for use in wine, it is the Australian wine industry's position that no genetically modified organisms, as defined under the Australia New Zealand Food Standards Code (Standard 1.5.2: Food Produced Using Gene Technology) be used in the production of wine.

This includes additives or processing aids defined as genetically modified foods according to Standard 1.5.2. Standard 1.5.2 sets down the criteria for defining a genetically modified food by addressing thresholds for formulation and refining processes to remove novel DNA and novel proteins. Underpinning Australian wine is a culture of innovation and a willingness to improve the way grapes are grown and wine is made.

The industry will therefore continue to explore new developments in all areas of science but will only apply these new practices commercially when there are clear consumer benefits and public acceptance of the practices.

While the use of GM in commercial grape and wine production is some way off in the future, most of the sector support the application of classical agricultural improvement strategies, including mutagenesis and breeding combined with phenotypic selection to produce new grapevine clones or microbial strains. Recent developments in modern molecular biology, such as high throughput genomics and systems biology have the potential to revolutionise the winemaking process (Borneman, Schmidt and Pretorius (2013)).

#### Barriers to the adoption of emerging technology

One of the most significant barriers to adopting emerging technology remains the underinvestment in public R&D. Increasing productivity in the agriculture sector continues to be a core policy objective of rural industries and Australian governments. Investment in research, development and extension (RD&E) is an important means of developing new technologies and management methods. Facilitating industry adoption drives long-term agricultural productivity growth. In recent decades there has also been a focus on developing technologies that are both profitable for farmers and deliver better environmental and human health outcomes. There is an ongoing debate in Australia about the role that governments should play in funding agricultural RD&E and the returns to such public expenditure.

Agricultural productivity growth has slowed over the past decade or so, (Sheng, Gray and Mullen (2010)). Extended poor seasonal conditions and international competitive conditions, including exchange rate moves explain some of this slowdown for the wine sector, but a long term decline in the growth of public RD&E since the 1970s has also been shown to be a factor (Sheng et al. 2010).

The returns to public agricultural R&D as reported in the literature appear significant, with no evidence that the rate of return to public RD&E investments is declining over time. For example, The Australian Grape and Wine Authority (AGWA) invests in and directs research, development and extension (RD&E) along the whole value chain 'from vine to glass' to enhance the profitability, competitiveness and sustainability of the Australian wine sector. Between 2000

and 2014, AGWA (formerly the Grape and Wine Research Development Corporation) funded 26 rootstock related research and development (R&D) projects with a value of \$18.6m (2014 real dollars i.e. adjusted for inflation), present value terms (5% discount rate). AGWA funding contributed about half of the total, with most of the balance coming from CSIRO Plant Industries. AGWA commissioned an independent evaluation of investment into rootstock related R&D. The net industry benefit was estimated at \$201m (Table 1) over a 2007-2040 timeframe (in 2014 dollars). Around 64% of the estimated benefits were derived from nematode resistance, 22% from bringing production of new plantings forward and 14% from improved WUE. Outcomes from the research were estimated to return gains to industry of around \$11 for each \$1 of R&D investment (using a real discount rate of 5%).

### **Resource allocation**

There has been much recent debate over the need to increase funding to increase demand for Australian wine. The Winemakers' Federation of Australia (WFA) has developed a comprehensive plan to restore profitability to our wine businesses and secure the futures of those regional communities and jobs that depend on their success. This blueprint for recovery entitled "Actions for Industry Profitability 2014- 2016" (referred to as the 'Actions') was developed following extensive industry consultation and has the majority support of the Australian wine industry. It was publicly released in December 2013 and incorporated the findings of an independent expert review on the profitability and dynamics of the Australian wine industry, completed in August 2013. While implementing the WFA Actions for the industry's recovery continues to be led and predominantly financed by industry, it also requires Government support to: Provide finite funding of \$43.4m1 over four years to the Australian Grape and Wine Authority (AGWA) to grow the demand opportunity for our wine and multiply the benefits of recent FTAs.

However, WFA has also identified funding for R, D&E as a key issue for the wine sector (see for example <http://www.wfa.org.au/assets/submissions/WFA-Submission-on-Agricultural-Competitiveness-Green-paper-f111214.pdf>)

There is a clear underinvestment in wine sector research in Australia compared to our competitors.

The two peak industry bodies representing the Australian wine sector have developed a common RD&E policy. The objective of the wine sector policy position on RD&E is to enable the efficient provision of research needed to allow the Australian Wine Sector to become the most profitable and competitive supplier of wine to the consumer. The critical policy underpinnings are:

- Government support for agricultural research is essential to address significant market failure issues and under-investment in innovation;
- Research activities must align with the wine sector's research priorities, be clearly stated and be of national and/or regional benefit to the sector across the entire supply chain;

- Research, development and extension capability within the wine sector needs to be actively built and maintained at an appropriate level to reflect industry conditions;
- A cooperative research approach between industry, researchers, funding bodies and Government needs to be fostered to ensure seamless integration of grape and wine research across the whole value chain; • International collaboration in publicly funded research activities should be undertaken only if there is a likely net benefit to the Australian wine sector and/or the wider Australian community;
- Intellectual property management must give priority to the timely dissemination of research results and uptake of research by the Australian grape and wine industry; and
- Dissemination and extension of the outcomes/results of R&D must ensure an efficient and effective system in line with industry expectations to ensure adoption of research outcomes.

WFA and WGGGA are also committed to ensuring AGWA retains its focus on research funding and maintains the investment of research levies for research activities. The legislation establishing the Authority is clear in that it maintains research funds (including reserves) for R&D activities.

#### **Role of government in public research and innovation**

Research processes necessarily deliver both private and public goods. While it makes sense that the private sector largely fund research delivering predominantly private goods and the public sector fund research delivering predominantly public goods, this problem of jointness means that there is no simple theoretically-sound formula to apply to determine where the boundary between public and private funding lies. The Australian RDC model is unique in the way in which industry is required to contribute to the funding of research through a levy matched by a government grant.

The RDC model has been based on the RDCs commissioning research predominantly from state departments, CSIRO and the universities. An emerging challenge to this model is the loss of scientific capacity, particularly in the state departments and CSIRO, as public investment has contracted.

Suggestions that the RDCs be encouraged to fund more industry research and that some proportion of the matching grant be diverted to a research institution tasked with only undertaking public-good research (Productivity Commission 2011), or that more public research funds be directed to partnerships with private firms (recent policy suggestions by government ministers), ignores the fundamental problem that by definition, the beneficiaries of research cannot be fully excluded from enjoying its benefits and have little incentive to reveal their true willingness to pay for these services. Consequently, investment in agricultural research is always going to be less than that desired by the community. The costs of a rigid demarcation between those institutions that do industry research and those that do public-good research is that the benefits from the non-rival nature of new

knowledge and economies from jointness are reduced (Grafton, R, Mullen and Williams (2015)).

The recent Green Paper on agricultural competitiveness (Commonwealth of Australia 2014) considered agricultural R&D and extension as one of eleven policy areas impinging on competitiveness. Unfortunately, no reference was made to the stagnation in investment in R&D in Australia as a likely cause of the present slowdown in productivity growth despite reference to other ABARES research in this area. While reference was made to the long lags in the initiation of R&D and the application of the technology on farm, most of the recommendations were related to better coordination and more efficient management of research resources to develop technologies of immediate 'practical on-the-ground' relevance (Grafton, R, Mullen and Williams (2015)).

Other recent reviews (NFF Blueprint for Agriculture 2013 and PMSEIC 2010) provided stronger support for increasing agricultural R&D in Australia. They also make clear that the scope of R&D activities is not just the development of technologies to enhance farm productivity, but extends to the scientific support required to protect Australia's natural resources, and to provide a scientific basis for describing the food safety, quality and environment attributes of farm products. This also includes research to support regulation and differentiated marketing, and to allow the development of market mechanisms for unpriced outcomes that may be underprovided if these types of research activity were left to industry.

The challenge for agricultural science policy is to generate productivity growth. One way this may be supported is to secure higher rates of investment by both government and industry that exploits the jointness between industry outcomes in the form of new technologies and public-good outcomes in the form of gains in scientific capacity, and new knowledge about the management of environment and human health issues. The gains to society from exploiting the non-rival nature of new knowledge and ameliorating market failure seem of far greater significance than those from additional efforts to reduce 'free-riding' (Grafton, R, Mullen and Williams (2015)).

### **Regulatory environment**

Australia is lucky in that the regulatory environment is not one that prevents the adoption of innovative technology. In the wine sector, in many countries production processes are strictly controlled. However, this control can have adverse impacts on trade, in that our wine exports are required to meet importing country requirements. The wine sector has been pro-active in identifying this issue and has worked assiduously to reduce the potential impediments to trade and therefore adoption by our producers. For example, in 2001 the Mutual Acceptance Agreement on Oenological Practices (MAA) which has full treaty status, was signed by Australia, Canada, Chile, New Zealand, and the United States and has since been extended to include Georgia, South Africa and Argentina.

The MAA is a landmark in the development of international trade. It is the first multi-lateral Mutual Acceptance Agreement, in any field, fully compliant with the



Technical Barriers to Trade Agreement. For winemakers, exporters and importers the implications of the Agreement are profound - assured access to markets without the costs and frustrations of barriers to trade based on differences in oenological practices.

The essence of the MAA is that wine made in accordance with oenological practices permitted in one signatory country may be imported into any other signatory country regardless of the rules applying to oenological practices in the importing country. This agreement recognizes the legitimacy of different approaches to making and regulating and also ensures that the introduction of new technologies is not likely to create disruptions in trade. In terms of barriers at the border, this agreement has obviated the need for certification of winemaking practices between signatories. It also establishes a number of benchmarks for international trade in wine, such as enshrining the primacy of the WTO agreements and the need to protect consumer health and safety and prevent consumer deception.

### **Conclusion**

The Winemakers Federation of Australia looks forward to working closely with the government to improve the efficiency of agriculture through innovation. Emerging technologies are already providing key research breakthroughs that are helping to enhance productivity. Although barriers to direct adoption of biotechnology remain, these techniques do provide the material for on-the ground productivity improvements that can be adopted by growers and winemakers.

There is a clear underinvestment in R, D&E and innovation in the Australian wine sector when compared to our major competitors. This needs to be addressed. WFA and WGA are committed to ensuring AGWA retains its focus on research funding and maintains the investment of research levies for research activities. Research and innovation provide the basis for long term industry improvements and should not be traded for off for short term gains. The government role in public investment into innovation is clear and has obvious national benefits.

### **References**

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