
Technical notes

Understanding the adoption of innovations by Australian grapegrowers and winemakers

A key measure of success for applied research is to have research outcomes adopted by end users. Often, however, researchers and investors find it difficult to predict and/or understand why some research findings are widely taken up and others are not, irrespective of the apparent return to the end user. This question was investigated in a recently completed project, which looked at factors influencing the adoption of innovations by Australia's grapegrowers and winemakers.

The project aimed to:

- segment the grape and wine sector to identify who adopted innovations
- understand why some innovations were adopted ahead of others
- investigate how people found out about innovations and where they sought information.

Why is this work important?

Understanding who has adopted innovations, what is being adopted and why, could help predict the target markets for individual innovations and also the most appropriate dissemination strategies to maximise the adoption of future innovations.

What is an innovation?

During the project, it was found that people were confused by the terms 'innovation' and 'adoption'. Grapegrowers and winemakers do adopt new technologies or practices but generally do not classify this as adoption or innovation. In this project an innovation was broadly defined as a technology, product or practice new to the person or enterprise using (adopting) it.

Which innovations were considered in the project?

Factors such as high cost, changes to infrastructure, training requirements or expertise needed can all potentially impede the adoption of an innovation. The project team thus considered 20 vineyard and 20 winery innovations in order to short-list two vineyard and two winery innovations to examine in depth. In both the winery and vineyard spheres these needed to be:

- one innovation likely to be relatively simple to adopt (low cost with no required changes to infrastructure or staff training)
- one innovation likely to be more difficult to adopt (high cost outlay, more complex, involving more effort, time, know-how or additional training to adopt).

The innovations needed to be relatively new, but around long enough to achieve some level of adoption by producers. Generally it was felt that they should have been in the marketplace for between five and ten years. Innovations considered in the short-listing process included salinity measurement tools, smoke taint measurement and remediation, rapid analysis techniques such as Winescan/Oenofoss®, tannin analysis, fruit sorting tables, alternative variety plantings and the Pellenc® grape harvester. In the end, the four innovations selected were:

	Vineyard	Winery
Low cost, easy to adopt	New chemical sprays (e.g. Dow AgroSciences Legend, Syngenta Revus)	Novel yeasts (e.g. Anchor Alchemy, Maurivin Platinum)
High cost, difficult to adopt	Soil moisture monitoring	Cross-flow filtration

How did the project progress?

Once the four innovations were chosen, a survey was developed to examine the influence of a range of factors on adoption behaviour. Information on demographics (age, location, climate), business size, financial position and future outlook was collected.

Grapegrowers and winemakers were asked a range of questions about their opinions and beliefs in regard to the selected innovations. These included:

- ‘perceived usefulness’ – how much they believed adoption of the innovation would help them reduce costs, save time/labour or improve quality
- ‘perceived ease of use’ – how easy they felt it was to use the particular innovation and if additional training or other changes would be needed
- ‘social norm’ drivers – if their peers, suppliers or customers thought they should be using the innovation
- ‘previous experience’ – if the innovation had been used or observed previously in other companies/countries
- ‘innovative factor’ – the general tendency towards early adoption of new technologies

Information seeking behaviour was also examined, including:

- how growers and winemakers first found out about an innovation
- what sources of information were used when making an innovation adoption decision
- why those sources were used
- how much information was sought.

In total 5,253 people were contacted across Australia, resulting in 1,066 completed phone and online surveys and 83 face-to-face interviews with grapegrowers and winemakers, all of whom played an active role in the decision-making process in their business. This sample ended up being representative of the range of business sizes and regional breakdown of the current Australian wine sector (2013 Australian & New Zealand Wine Industry Directory).

Results

What innovations were being adopted?

As expected, low-cost, easy-to-adopt innovations had a greater adoption rate (Table 1). Of the 1,066 participants surveyed, 66% of growers had adopted or trialed new chemical sprays whereas only 33% had adopted soil moisture monitoring. For winemakers, 60% had used novel yeast at least twice and 41% had purchased or leased a cross-flow filtration unit.

Vineyard	% Adoption
New chemical sprays	66
Soil moisture monitoring	33
Winery	
Novel yeasts	60
Cross-flow filtration	41

Other innovations mentioned by respondents included the planting of alternative varieties, composting, use of weather and irrigation phone apps, anaerobic juice settling by flotation, energy efficiency practices (temperature control systems), fruit sorting tables and infra-red spectroscopy.

Who was adopting?

Business size affected adoption. Smaller businesses were less likely to adopt the high cost, difficult-to-adopt innovations, due to both financial constraints and a greater risk to their business associated with adoption if the innovation did not work. Smaller businesses tended to adopt low-cost, easy-to-adopt and already proven technologies. Larger scale wineries and vineyards were found to adopt more, particularly those technologies that helped achieve expansion or efficiencies and automation in line with their scale of operation, e.g. soil moisture monitoring or cross-flow filtration.

Age was also linked to adoption, with the youngest segment (<34 years of age) more likely to be confident of increasing productivity and to adopt innovations.

What influenced adoption?

Financial outlook

The financial outlook of a business, and the attitude toward increasing productivity, influenced general approaches to innovation adoption. Businesses that were struggling financially, reducing their scale of operation or expecting to be sold had little intention, motivation or capacity to spend money or time adopting new expensive technologies. They did, however, still trial new low cost products such as novel yeasts and new chemical sprays if those products enabled them to continue operating at a reduced cost.

In contrast, businesses that were increasing their scale of operation were more confident of increasing productivity and more likely to adopt the more expensive or complex technologies to achieve this, such as wine presses, cross-flow filtration or soil moisture monitoring.

Grapegrowers and winemakers that were financially stable but not able to invest heavily in new technologies still adopted innovations but focused on those technologies that were not capital intensive and that would provide clear short to medium term benefits to reduce costs and increase efficiencies, such as flotation processes and energy saving technologies.

Perceived usefulness

The belief that a technology would provide benefits such as reducing operating costs, saving time or labour, improving product quality or increasing workplace safety, was found to be the key driver of adoption in this project. For high cost and more complex technologies, this influence was moderated by the business size, financial position and the individual's motivation towards increasing the productivity of their business.

The opinions of respected growers or winemakers in the region also emerged as a key driver for adoption, with information from the industry 'grapevine' being highly valued as credible, independent and experience based.

How did people find out about innovations?

Seminars, salespeople, friends and trade magazines were all mentioned as primary sources of information, although in many cases respondents could not remember where they had first heard about the innovations. Seminars and workshops can be seen as an important mechanism for planting the seed about the innovations available to producers, and prompting them to think about adopting new technologies or practices. They also provide a good opportunity to network and discuss innovations with both presenters and attendees.

Where did people seek information?

When making a decision whether or not to adopt an innovation, producers generally sought out specific information to assist with their decision-making. With simple, low risk innovations people typically used only one or two sources of information to assess the innovation. With more complex innovations, multiple sources were used, including:

- independent experts (consultants, industry or government organisations or scientists)
- written articles
- other grapegrowers and winemakers
- suppliers
- viewing the technology in action at another vineyard/winery or field day.

For example, a winemaker deciding to use a new yeast might look on a website and talk to a supplier and a colleague who had used it. This process could take an hour or a few days. However, when considering the adoption of cross-flow filtration, a winemaker typically used more than five sources of information. Most winemakers would trial the technology, often over several years before adopting, unless they had previous experience, in which case this process was shortened.

What are the implications?

The results of the project suggest that an organisation developing a complex or potentially risky innovation will need to provide a range of types of information and communicate through a number of channels to boost adoption rates. Demonstrations of the innovation that showcase its usefulness and ease of use are likely to be most convincing, maximising the chance for information to move through the industry network.

People also tend to have a pecking order for seeking information. Many grapegrowers and winemakers indicated that they use online search engines at the beginning of their information search, rather than specific websites. For information providers this suggests that search rankings are important in ensuring information reaches its target audience. Again, the strong industry network within the grape and wine sector emerged as important, with trusted colleagues often being asked for opinions about innovations. Independent experts and advisors who are trusted and accessible are also valued. Interestingly it was also found that people who were active and closely involved in industry networks and associations were more likely to adopt innovations than those who were less connected.

Summary

In this project a number of general principles and concepts from marketing and adoption literature were tested and found to be applicable and potentially useful to the Australian

wine sector and those seeking to maximise the adoption of innovations.

Segmentation of the grape and wine sector was mainly determined by:

- financial and business outlook
- several dimensions of an innovation's perceived usefulness, but this did vary with each individual innovation

Overall the work suggests that market segmentation and message design need to be tailored to the individual innovation to encourage maximum adoption. Guidelines for doing this can be found in the project report. For all innovations, adoption strategies must show a clear link to factors that reduce costs, increase quality or save time while also demonstrating easy implementation. This will allow the strong industry network and key influencers within regions to validate and communicate the messages across the sector.

Further information

The full project report is available from the AGWA website:

http://research.agwa.net.au/completed_projects/adoption-of-grape-and-wine-rd-outputs-who-what-and-why/

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