

A case for strategic national oversight of Australia's grapevine foundation assets

*Underpinning the competitiveness of the
Australian wine sector*



Halt the slide

*Prepare the way for an effective
national management structure*

*Find long-term solutions that
respond to prevailing realities
and future possibilities*

September 2014

GWRDC Project WGG1401

Summary of recommendations

Objective

National strategic oversight of Australia's grapevine foundation assets

Stage 1: Halt the slide

Australia's genetic resources are in decline through lack of resources and no clear decision-making focus. The first step is to halt this slide to allow time for rational decisions to be made about the future of the current collections.

Recommendations:

1. That WFA and WGGGA support the need for national strategic oversight of Australia's grapevine foundation assets
2. That WFA and WGGGA request AGWA to assume responsibility for the strategic oversight, systems and – where appropriate – regulations relating to Australian winegrape foundation assets
3. That the following steps are taken to protect the current collections in the immediate-term and to move towards a medium-term model where only the desired nuclear varieties/clones are maintained – in one or more physical locations.
 - a) Confirm an arrangement for VAMVVIA to maintain the Dareton collection for the next two years and supply cuttings on request on a fee-for-service basis
 - b) Commit funding for virus testing of up to one-third of the Dareton collection to maintain its high health status for the next two years (2014 and 2015) – while decisions are made about which varieties/clones are needed in the longer-term
 - c) Undertake a review of the varieties in the two principal collections: Dareton and Monash to determine the optimum list of commercially in-demand varieties that should be supported by industry at this time
 - d) Negotiate agreements with the owners of those collections as required in regard to the costs of maintaining the nominated vines – including virus testing
4. That AGWA:
 - a) Takes on primary responsibility for the review and ongoing maintenance of the Australian Standard for Grapevine Propagation Material AS 5588-2013, and
 - b) Undertakes review of the virus testing protocol within the Australian Standard 5588-2013, to determine whether an alternative schedule could provide equivalent assurance of health status at a reduced cost
5. That a committee be appointed and the position of Collections Coordinator be created to support the staged implementation of the model and the achievement of long-term solutions

Stage 2: Prepare the way for an effective national management structure

In preparation for a future management and decision-making structure that is accountable to industry, provide a nationally led structure that ties together and coordinates the current diverse range of entities and stakeholders.

Recommendations:

6. That AGWA negotiate on behalf of the Australian wine sector with the Federal and South Australian Governments in regard to CSIRO and SARDI collections with a view to developing memoranda of understanding for access to and the development of these collections.
7. That AGWA oversee the development of a publicly accessible Australian Grapevine Register, building on existing registers and platforms as appropriate, and considers the value of linkages to the Label Integrity Program

Stage 3: Find long-term solutions that respond to prevailing realities and future possibilities

Find long-term solutions that will address the complexities of this area, covering issues including: varietal selection, purpose of the genetic resource, determination of health status, identity verification protocols, cost-benefit analysis, funding sources, intellectual property rights, role of private collections, cross-sectoral relationships, technological developments etc.

Recommendations:

8. That the wine sector support the staged implementation and funding of the model as outlined in this report, to enable it to develop a foundation for an ongoing management structure that is flexible and responsive and can support the sector's overall performance and deliver value in the long term.

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Business plan summary of key points

- Australia needs grapevine foundation assets to secure its long-term competitiveness and sustainability through the health, quality and integrity of its vineyards.
- These foundation assets are currently under significant threat and many will be lost or deteriorate beyond rescue if action is not taken
- Many attempts have previously been made to develop a “solution” to the management of grapevine foundation assets, but these have not succeeded due to a lack of national industry leadership
- Central to the proposed model is that the Australian Grape and Wine Authority (AGWA)¹ take on the role of strategic national industry oversight of grapevine foundation assets
- The other key elements of the model are:
 - ★ A staged approach to implementation
 - ★ the establishment of a national, publicly accessible register of all grapevine varieties and clones in Australia
 - ★ the development of MOUs with CSIRO and SARDI to secure access to these major government-owned collections
 - ★ funding to protect the high-health status of a small number selected vines in two existing nuclear (high-health) collections.
- The model is intended to protect existing assets and capitalise on their value, and provide flexibility to respond to new opportunities, bring in new technologies and create efficiencies over time.
- The total levy funding required to implement the model is approximately \$124,000 per annum – or less than 1% of the industry levies collected by AGWA

Overview

In November 2013, Wine Grape Growers Australia (WGGA) facilitated a meeting of stakeholders to identify a process for deciding on the future for grapevine germplasm collections in Australia. This meeting was attended by 30 representatives of industry, government, vine improvement and industry organisations. The meeting expressed strong support for the proposal that a business plan be developed and endorsed by industry for the long-term management of germplasm collections in Australia. A working group was formed to develop the business plan (see appendix for list of members).

This paper presents the business plan, which has been developed with financial support from GWRDC and WGGA. It builds on a previous paper prepared by Prue McMichael, Richard Hamilton and Libby Tassie, which reviewed the existing collections in Australia and identified best practice management of planting resources in comparable viticultural industries overseas and other perennial crops in Australia. It is *strongly recommended* that the McMichael paper be read in conjunction with this one as it provides important background information.

¹ The new merged authority taking the place of Wine Australia Corporation and GWRDC

Why do we need grapevine collections?

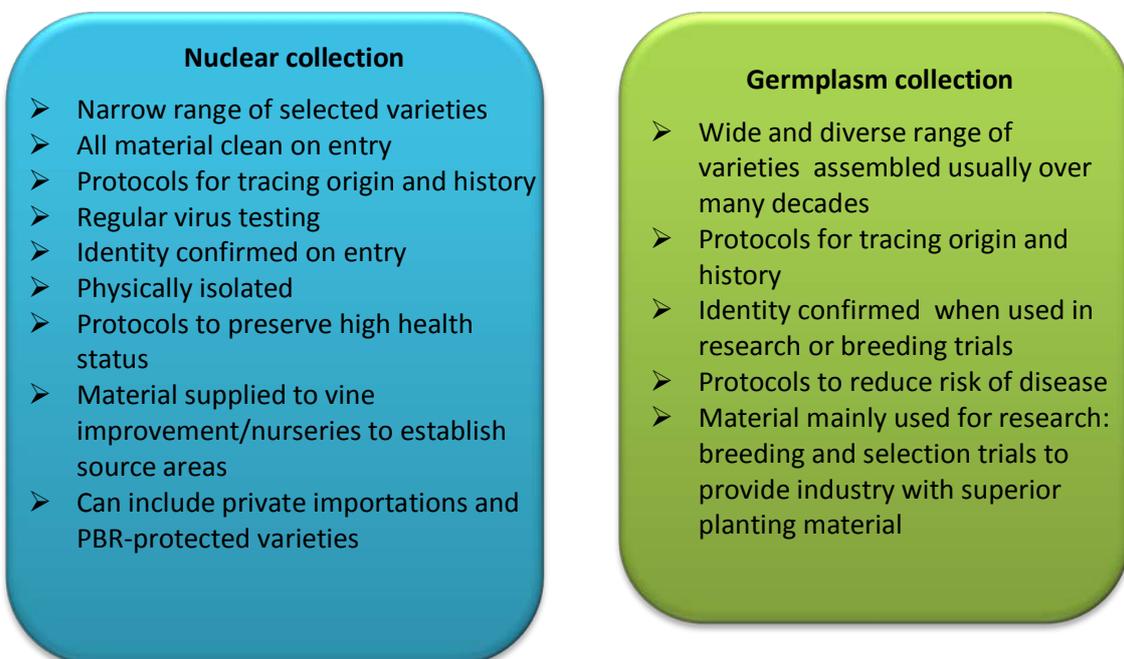
In order for the Australian wine industry to continue to prosper in future, it needs to be successful in an increasingly competitive global market where the average standard of winemaking is very high, margins are tight and regulatory requirements including for truth in product labelling are very strict. This means the industry has to be efficient, innovative and strictly compliant throughout the value chain from grapes to glass.

High quality planting material is fundamental to competitiveness, being at ground zero in the value chain. True-to-type planting material underpins all label integrity claims. Healthy vines optimise production potential, while specifically selected clones can provide a competitive advantage in adaptation to climate conditions and/or the expression of desired characteristics. Innovation, through breeding and selection, allows for continuous improvement in the choice of planting material.

Although demand for planting material is currently low, it is critical that Australia maintain a foundation of healthy, best available and true-to-type planting material in order to:

- underpin the supply chain and ensure the integrity and quality of future vine plantings,
- ensure innovation and continuous improvement in the development of best-suited clones for our environment and markets

Types of grapevine foundation planting collections²



Nuclear collection – an elite collection of carefully selected reference vines in current or likely future commercial demand.

Germplasm collection – a genetically diverse repository or “library” of all reference material available in Australia.

² Definitions for the purpose of this paper do not include private importations or PBR-protected varieties that cannot be made publicly available.

Benefits of grapevine genetic collections

The Australian wine industry is fortunate to have significant and diverse grapevine foundation assets. Currently the total number of different varieties and clones, including rootstocks, held within various collections around Australia, is estimated³ to be close to 900, with multiple clones of some varieties. They include reference vines of the most important commercial varieties and clones, with confirmed identity and high health status, original (mother) vines that have been imported into Australia, clones selected through local trials, old or little known varieties of possible research interest and heritage vines including pre-phylloxera material possibly unique to Australia.

The benefits to the wine industry of investing in our grapevine foundation assets are:

- Timely and cost-effective supply of in-demand clones and varieties
- Greater assurance of varietal and hence label integrity on Australian wine products
- Access to a diverse range of varieties and clones to enable breeding and innovation
- Quicker access to best available material in the event of a major replanting requirement
- Preservation of heritage and unique varieties and clones for future generations
- A higher overall standard of planting material used in Australian vineyards (including health status and performance characteristics)
- Maintenance of our international reputation for innovation and best practice in supply chain management

Whilst difficult to quantify, the following example gives an indication of the benefits associated with maintaining these assets.

Chardonnay clones in Australia

*Chardonnay clonal material planted in Australia up to the 1960s was notoriously fickle in regards to yield as the main clones being used suffered from millerandage or “Hen and chicken”. Although these clones produced good quality wine their low yields meant profitability was low. As demand for Chardonnay increased, growers turned to another Chardonnay clone, I10V1 which was widely available through vine improvement groups and therefore commercial nurseries. I10V1 was imported in 1969 from the UC Davis collection and is now the most widely planted clone in Australia. Assuming an average increase in yield of 10% as a result of half the Chardonnay area planted in Australia changing to the better clone, and an average price per tonne of \$300 (which is well below the prices that were being paid during the 1990s), the effect of using the better clone can be valued at **\$4.5 million per year** to grapegrowers.*

A similar principle applies to Merlot clones, and indeed to the use of any rootstock that confers benefits in terms of salt or drought tolerance, nematode resistance etc. Small increases in productivity translate into considerable sums at the industry level.

³ McMichael (2013) *Summary of a review of grapevine germplasm collections in Australia* GWR 1112

Why do we need to take action?

This significant and valuable genetic resource is threatened, and without urgent attention, much of it will soon be lost or will deteriorate beyond rescue. This is as a result of three key issues relating to the collections:

- Lack of a secure funding source for maintaining collections that is independent of industry cycles
- Reduced government support and restricted industry access to germplasm collections
- Lack of strategic leadership and coordination to address problems, maximise efficiencies and protect assets for the future

Fluctuations in funding

In the boom period of the 1990s and early 2000s, demand for improved planting material was so high that vine improvement organisations could barely keep up. There was enough money from cutting sales to pay for the administration of the regional and state vine improvement organisations and for the establishment of a national peak body – the Australian Vine Improvement Association (AVIA). Vine Improvement organisations took a lead role in driving the continued supply of healthy, true-to-type planting material, regional trials to identify superior clones and liaison with government over maintenance of and access to germplasm collections. A national elite nuclear collection of specially selected, high health status vines was established in 2005-06 under the auspices of AVIA, with nearly \$200,000 in government and industry funding.

Since then, the operating environment has changed dramatically. New plantings have been very low since 2007. This means very little money has been available for funding Vine Improvement operations.

The AVIA collection is now unfunded and relies on the goodwill of the Victorian and Murray Valley Vine Improvement Scheme, the NSW government and volunteer staff for basic maintenance and survival.

Reduced government support and restricted access to collections

Over the past 10 – 15 years, governments have withdrawn significant resources from extension, research, selection and education in grapevine improvement as well as from the active maintenance of the germplasm collections. The Tasmanian and Queensland state-owned collections have been removed or mothballed, the New South Wales and Victorian Governments have withdrawn from actively supporting germplasm collections, and there have been no new accessions to the SARDI collection for 15 years. In Victoria and South Australia, the number of FTE staff involved in research, trials, vine health and maintenance with government germplasm collections has reduced by more than 75% from 25 in 1986 to 3.5 in 2013⁴.

Since 2009, the CSIRO and SARDI germplasm collections have been closed to industry after a variety sourced from the CSIRO collection was found not to be as identified (vines believed to be Albarino were found to be Savagnin Blanc). Although no legal action followed in this case, for governance and risk management reasons CSIRO responded by closing their collection to industry. Until this major issue can be resolved, both the CSIRO and SARDI collections (the largest and most diverse in the country by a long way) remain closed, and industry has no access to the material they contain – much of which is unique to these collections.

⁴ McMichael (2013) *ibid*

Leadership void

There is currently no national, cohesive direction being provided for the protection and strategic coordination of our grapevine foundation resources. The industry growth period of the 1990s and early 2000s masked structural issues that had developed over time as a result of having a distribution mechanism (the Vine Improvement scheme), entirely dependent on volunteers, that by default had assumed decision-making responsibility for national grapevine foundation assets.

Private nurseries are now major players in the distribution chain – importing many of the new varieties and clones identified as being of commercial relevance on their own initiative. While they are clearly customer-focussed, private nurseries are commercial and operate independently of each other and of vine improvement, therefore there can be duplication of imports, inconsistent naming of clones, inequitable access and lack of consideration for any variety not currently in commercial demand. As well as this, they are vulnerable to fluctuations in industry cycles and are unlikely to have the funds to invest in long-term research or maintenance of assets that do not provide a current commercial return.

What happens if we do nothing?

While increasing market access and demand is undoubtedly the top priority in the current industry climate, it is important to ensure that successful marketing efforts can be supported by a reliable, responsive supply of planting material.

If the industry does not take active steps to protect and improve the foundations of its supply of grapevine material, it will see the gradual deterioration of its supply of foundation planting material and ultimately a decline in the health, integrity and productivity of Australia's vineyard asset base. Since 1991, the vineyard asset has tripled in size from 60,000 hectares to 170,000 hectares, and many of these vines are reaching an age where they will need to be replanted.

Australia's relatively healthy grapevines and planting source material are also an important competitive advantage that needs to be actively protected. The absence of phylloxera in most grapegrowing regions means that vines can be planted on their own roots, which limits the expression of viruses. However, as rootstocks are used increasingly to combat drought, nematodes or other issues, the industry's exposure to damaging viruses increases, as does the value of keeping them out of commercial vineyards. In South Africa, losses in production due to Grapevine Leafroll-Associated Virus type 3 in combination with vine mealybug are dramatic and uncontrollable. It is estimated that vineyards in South Africa need to be replanted every 10 years as a result of the damage done by this virus and the rapid spread of it due to the mealybug.

The following scenarios illustrate other potential consequences and costs of not having a source of high health, true-to-type planting material.

Varietal misidentification

Correct varietal identification underpins label integrity, which is a legal requirement for exported Australian wine. The following example illustrates the potential costs of incorrectly identified planting material.

Assuming that a grower discovered that the wrong variety had been planted after three years of production and had to replant, this could amount to \$30,000 in establishment costs just for one hectare plus three years lost earnings while the replacement vines became established and possible litigation from the winery to whom the wrong variety was supplied. There would also be the potential for losses or litigation against the winery that sold the wine under an incorrect name. If the error

was traced back to a commercial source of planting material that had been widely distributed, the industry-wide losses could be extensive not just in terms of rectifying the error but also in loss of reputation and trust in the Australian wine brand.

Importing costs

If Australia did not maintain its own collection of varieties and clones that might be required in future, then theoretically it could re-import any varieties it needed at the time that they were in demand. However, the costs and time delays would be significant.

Importation of material from overseas requires up to two years in quarantine and an estimated cost (currently) of \$5000, followed by at least three years to produce commercial quantities of cuttings – introducing a five year delay and a significant cost before commercial establishment can even begin – as well as the risk of the plants not surviving. There is also a risk that some overseas collections will deny future access – as has happened recently with the Spanish collection. If just two vines per year were taken from a foundation collection held in Australia instead of being re-imported (assuming that were still possible), this would save the industry in immediate costs the same as maintaining the whole collection for 12 months – while the value of being able to respond up to five years more quickly to changes in consumer demand is impossible to quantify.

In summary, failure by industry to take responsibility for active national oversight of grapevine foundation resources will lead to:

- Continued deterioration in the integrity and high-health status of existing collections
- No leadership to resolve the stalemate over access to the major government-owned germplasm collections
- Increasing risk of incorrect identification of material and consequent major losses to growers and wineries and risks to the label integrity program's objectives
- Continuing reduction in government resourcing of grapevine breeding and selection programs as well as maintenance of germplasm repositories – leading to a decline in R&D and the possible closure of our major germplasm collections
- Further fragmentation in bodies involved in grapevine propagation and distribution leading to variations in standards, confusion, duplication, loss of assurance of varietal names and origins and likely overall increases in costs to grapegrowers
- Possible significant delays and costs in obtaining material to meet a future increase in vineyard development – if material has to be re-imported
- Gradual deterioration in the integrity and health status of grapevine propagation material planted across Australia
- Slower response to the next up-cycle in the industry as planting material will need to be built from a lower, neglected base
- Reduced ability to respond quickly to new trends for varieties and clones
- Erosion of Australia's international competitive advantage due to its relatively clean planting material and ability to plant with ungrafted vines – as competitors invest more in the integrity and health status of their grapevine genetic assets

RECOMMENDATION 1

That WFA and WGA support the need for national strategic oversight of Australia's grapevine foundation assets.

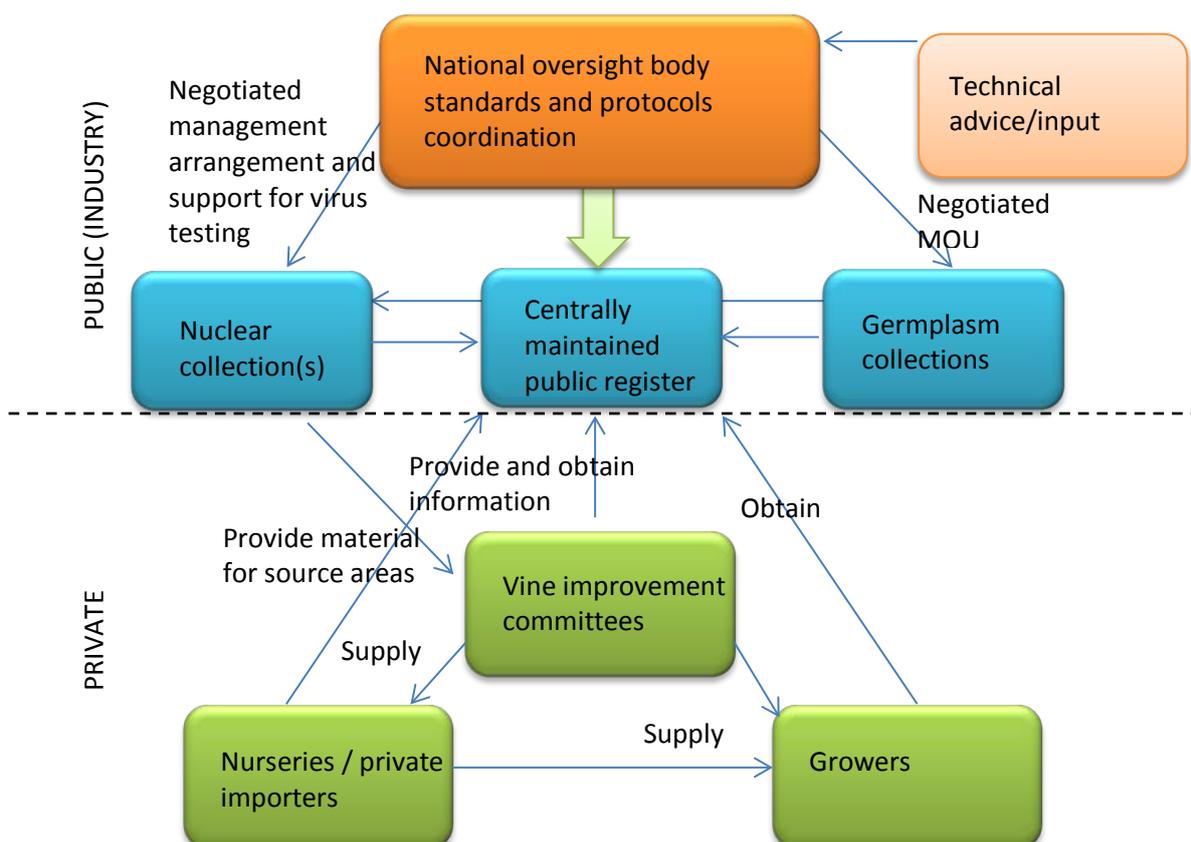
A model for strategic oversight of Australia’s grapevine foundation assets

Previous attempts at sorting out industry’s grapevine germplasm and nuclear collections have failed because they have attempted to address elements within the existing system without considering the system itself. Without resolving the governance framework up front, a sustainable model cannot be implemented. Therefore **the central element to this proposed model is national industry oversight to ensure appropriate governance and strategic consideration of collections to deliver the outcomes required.**

Key elements of the proposal

- Identification of an industry body to take on strategic oversight and coordination responsibility – supported by a technical advisory committee
- Provision of support for existing nuclear collections to secure a minimum supply of high-health material – at least in the short term
- Development of Memoranda of Understanding with owners of major germplasm collections: SARDI and CSIRO
- Establishment of a national, publicly accessible register of all the grapevine (winegrape) varieties and clones in Australia, and
- National custodianship of the Australian Standard for grapevine propagation material.

Diagram of the proposed future system



The emphasis is not on *ownership* of physical assets but on strategic deployment of those assets and partnership arrangements that can deliver the best outcomes for the least cost. None of the organisations, structures or collections identified in the system is new; rather the relationships between some of them and the assigning of responsibility for strategic oversight of grapevine foundation resources to a national industry body is new.

The model is intended to provide **flexibility** to respond to new opportunities, bring in new technologies and create efficiencies over time. It will have the aim of continuous improvement in the operation of the system, support the industry's overall performance and risk management and deliver value long term.

The components of the proposed model are described below.

Strategic objectives of the model

The strategic objectives of the proposed model are to:

1. Facilitate timely and cost-effective access to the best available high health status, true-to-type vines in commercial demand
2. Protect label integrity through the assurance of the identity of the foundation vines
3. Enable grapegrowers to select the best suited vines for Australian environmental conditions and market requirements
4. Support innovation through research, breeding, selection and adoption of new technologies in grapevine multiplication, virus testing and virus removal
5. Identify Australia's unique and heritage vines and exploit their value eg for breeding and selection and international exchange of material, as well as to authenticate the Australian wine story.

Industry oversight body

The industry body that takes this on must be national, broadly representative, sustainable and secure, with robust governance. The most appropriate body to take on this role at least in the first instance is the Australian Grape and Wine Authority (AGWA)⁵ because:

- It is an established statutory body with a legislated industry purpose within which the integrity of the supply chain and research, development and innovation are a natural fit.
- It already has responsibility for the enforcement of label integrity regulations, which function is supported by the coordination of the collections and the national register
- It is already an investor in R&D through organisations that currently hold germplasm collections such as CSIRO and SARDI
- It has the capability to deal with regulatory issues such as standards and protocols
- It is funded jointly by all grapegrowers and winemakers through the Grape Research levy, Wine Grapes Levy and the Wine Marketing Levy – and receives matching funds from government
- It has an established governance framework and infrastructure

AGWA is a whole-of-value-chain organisation with the ability to influence this issue from the ground-level genetic material through to the competitive edge needed in the marketplace.

⁵ Other organisations considered were: WFA/WGGA (jointly) and AWRI. Industry consultation strongly indicated a resistance to the establishment of a new body for this purpose.

A “Collections Coordinator” position is required to carry out the activities necessary to implement the model, under the guidance of a committee or nominated person appointed by the industry body. This position could possibly be combined with other responsibilities such as biosecurity and/or environmental stewardship, working under the auspices of the Winemakers’ Federation of Australia (WFA) and WGGGA as well as AGWA.

Technical input

The industry oversight body would need to receive technical advice and input in a number of areas including:

- Selection and review of the varieties and clones held in the nuclear collection
- The review and promotion of the Australian Standard for grapevine propagation⁶
- Advances in technologies relating to breeding, propagation, virus testing and virus identification that may impact how the collections are held and what they contain
- Research priorities for selection and breeding projects

Pragmatic, national, expert, independent input is essential to ensure the industry body receives up-to-date information on the latest research, risks, trends and technologies. This advice could come from a number of existing bodies/committees such as universities, the Australian Wine Research Institute (AWRI), AVIA, the Vine Industry Nursery Association (VINA) and the National Viticulture Biosecurity Committee (NVBC), or from a dedicated group selected for the purpose.

RECOMMENDATION 2

That WFA and WGGGA request AGWA to assume responsibility for the strategic oversight, systems and, where appropriate, regulations relating to Australian grapevine foundation assets.

That a committee be appointed and the position of Collections Coordinator be created to support the staged implementation of the model and the achievement of long-term solutions.

The foundation collections

Nuclear collection/s

The wine industry requires a small, carefully selected supply of high health status and true-to-type material for timely supply to industry. The number of varieties/clones maintained should be kept to a minimum of potentially commercially relevant varieties – taking into account different regional priorities and minor but growing varieties.

Currently there are three candidate collections in Australia:

- WA government-owned collection in Manjimup, WA.
- South Australian Vine Improvement⁷-owned collection in Monash, SA
- AVIA-owned collection in Dareton, NSW

⁶ This document was developed over two years with substantial GWRDC investment and published in 2013. However, without a peak body to support and promote it and to determine where its provisions fit within the system, it has not gained any traction so far. It is a very valuable resource that can support the new model; however, there is general acknowledgement that some of its protocols need to be reviewed to be practical. This role will be taken on by the new organisation on behalf of industry.

⁷ Known as the Australian Grapevine Foundation Planting Service (AGFPS)

The WA collection is well-resourced and maintained with funding from the WA government and operated by WA Vine Improvement Association. It has a smaller range of varieties than the other collections, and it is difficult to introduce new varieties into the collection from outside of WA because of the strict quarantine regulations. It is not currently considered suitable to meet the whole of the wine industry's needs for high health vines.

The South Australian collection is very new – having been moved from Kapunda to Monash in 2012 due to practical difficulties in maintaining it at the Barossa site. It is reliant for funding on sales of cuttings. Concerns have already been raised by the organisation regarding its ability to support the collection to the standard required for a high health industry collection in times of low demand for cuttings.

The AVIA collection was established in 2005-06 with industry and government funding, but its only source of ongoing support has been through levies on sales of cuttings paid to AVIA – which are no longer collected. Since AVIA is no longer financially viable, the collection lacks not only a source of funding, but any “official” oversight. It is currently being maintained at no charge by the Victorian and Murray Valley Vine Improvement Association (VAMVVIA), which has a site nearby, but it is not being virus-tested so as to preserve its high health status.

RECOMMENDATION 3

That WFA and WGGGA support the following steps to protect the current collections in the immediate-term and to move towards a medium-term model where only the desired nuclear varieties/clones are maintained – in one or more physical locations.

- 1. Confirm an arrangement for VAMVVIA to maintain the Dareton collection for the next two years and supply cuttings on request on a fee-for-service basis**
- 2. Commit funding for virus testing of up to one-third of the Dareton collection to maintain its high health status for the next two years (2014 and 2015) – while decisions are made about which varieties/clones are needed in the longer-term.**
- 3. Undertake a review of the varieties in the two principal collections: Dareton and Monash to determine the optimum list of commercially in-demand varieties that should be supported by industry at this time**
- 4. Negotiate agreements with the owners of those collections as required in regard to the costs of maintaining the nominated vines – including virus testing**

Germplasm collections

Preserving genetic diversity in the supply of grapevine propagation material and capitalising on its value through innovation is essential to the industry's future competitiveness. The two major germplasm collections in Australia are the South Australian government-owned (SARDI) collection at Nuriootpa and the Commonwealth government-owned (CSIRO) collection at Koorlong near Mildura. The SARDI collection has approximately 750 varieties and clones, while CSIRO has approximately 1100 varieties/clones (with 2-5 plants of each).

Currently there are three identified issues with these collections from an industry perspective:

- gradual withdrawal of government resources from collection maintenance
- perceived poor communication between industry and government over research requirements and lack of access to the results
- lack of industry access to the material in the collections

This model proposes that these issues be addressed through negotiating agreements or Memoranda of Understanding which each collection owner, that include a direct role for industry in decision-making relating to the collections, a recognition of the important

contribution made by government to the maintenance and preservation of the collections and an agreement over liability issues relating to the supply of material. Such agreements could be expected to facilitate securing future government funding for collections, improved outcomes from research and industry access to valuable clones and varieties.

AGWA is a major funder of research conducted by CSIRO, and is well placed 'government to government' to negotiate such agreements.

RECOMMENDATION 4

That AGWA negotiate on behalf of the Australian wine sector with the Federal and South Australian Governments in regard to CSIRO and SARDI collections with a view to developing memoranda of understanding for access to and the development of these collections.

The national grapevine register

A key element of the new model is a centrally maintained, publicly accessible Australian Grapevine Register of all⁸ publicly and privately held grapevine varieties and clones.

Such a database will:

- Ensure label integrity from the crusher back to the vineyard
- Prevent multiple imports and duplications of the same varieties
- Add assurance of the variety / cultivar naming and clonal identity
- Be a valuable source of information for growers
- Allow strategic decisions to be made about what varieties need to be kept in a national nuclear collection, and where "back-ups" exist if required

In future, an accessible, accurate and comprehensive national register has the potential to encompass the locations of private collection reference vines and hence to reduce the number of vines required to be maintained by industry. It may also be possible for the register to be integrated with the proposed National Vineyard Database, as and when that is established.

As part of GWRDC-funded project GWR1112, the researchers updated the existing 2006 National Register (Nicholas 2006). However, they identified a number of gaps and data limitations – eg in naming guidelines, consistent reporting of imposed treatments and agreement on accepted synonyms. Of more concern, the register was not able to be made available publically due to confidentiality agreements with some of the collection custodians and copyright issues. Therefore the major requirement in order to achieve the objectives above is to secure agreement for the public release of the information in the register. This is likely to be tied in with the negotiation of agreements with the major germplasm collections. Secondly, funding will be required to address the issues identified and ensure that the register is up-to-date and comprehensive, and produced in a format that can be publicly accessed. None-the-less, a significant investment has already been made in building the database, which will be wasted if it cannot be brought up to standard and released for industry use.

RECOMMENDATION 5

That WFA and WGGGA support AGWA overseeing the development of a publicly accessible Australian Grapevine Register, building on existing registers and platforms as appropriate, and considers the value of linkages to the Label Integrity Program

⁸ It may not be possible to cover all material; however indications are that private collectors would support the register.

Industry-determined and enforced standards

According to Hayes (2013)⁹, Australia suffers considerable uncertainty and risk in our viticultural base. In reporting on the case to develop an Australian standard for propagation Hayes notes:

Our range of varieties is based generally on very-long established grapevine varieties often of uncertain lineage and provenance. There is no national set of standards for planting material that enables a grower to be sure of what the health status of their planting material is or indeed if the material is what it is claimed to be. In fact, there is no national or international consistent naming convention for grapevine accessions and given the demands of Wine Australia's Label Integrity Program, particularly when relating to claims of the varietal components of wines, serious attention to these matters is warranted.(pg 5)

Since then, an Australian Standard for Grapevine Propagation Material has been developed with industry funds (through GWRDC) and was published in 2013, but has not been taken up by any vine improvement committee or nursery to date.

There is also a national nursery accreditation scheme in place, run by the Vine Industry Nursery Association (VINA), which sets protocols for the supply of propagation material to assure its health status and identity. This scheme is supported by some but not all of the commercial nurseries, and its protocols are not subject to external scrutiny outside of VINA membership.

Properly promoted and scrutinised by the industry, the Australian Standard and the VINA accreditation scheme would complement the national register, support the objectives of the grapevine foundation assets coordination model and collectively tie into label integrity objectives.

RECOMMENDATION 6

That WFA and WGGGA support AGWA:

- 1. Holding primary responsibility for the review and ongoing maintenance of the Australian Standard for Grapevine Propagation Material AS 5588-2013, and**
- 2. Undertaking a review of the virus testing protocol within the Australian Standard to determine whether an alternative schedule could provide equivalent assurance of health status at a reduced cost.**

⁹ Australian Vine Quality Standards Scheme – Vine Assurance. Final Report to Grape and Wine Research and Development Corporation Project Number GWR 1002 September 2013.

Other parts of the system: the distribution side

Vine Improvement

Foundation material needs to be distributed to industry according to protocols for handling and labelling that will maintain the integrity of the supply chain. In terms of an effective distribution network, vine improvement groups are generally well set up, well supported at regional and/or state level, adequately resourced for the distribution of material and flexible enough to adapt to fluctuating demands for material. Opportunities exist for vine improvement groups to manage collections under standard protocols set by the industry oversight body. AVIA owns the copyright to the 2006 National Grapevine Register, has responsibility for the Dareton collection and holds a number of propagation agreements with the owners of imported varieties. Negotiations need to take place between the industry body and AVIA to determine the future of these important assets.

Private collections and nurseries

The contribution of private collections to the effectiveness of the supply chain is also very significant. Private collectors are able to invest in market research, identify consumer trends and take commercial risks in importing new varieties from overseas that may be in demand in future. They are seen as a significant contributor along with vine improvement in providing growers access to new varieties, and can make a valuable contribution to the development and review of standards and selection of varieties. Most private importers are commercial nurseries, who are an essential link in the supply chain for best available material – whether or not it is imported. They are major customers of vine improvement in purchasing material from source areas and their commitment to using improved material is very important. To support their efforts, reduce the risk of duplication and maintain standards, engagement with private importers and nurseries is critical.

Other collections

Aside from the five collections mentioned above, there are a number of other germplasm and nuclear collections currently in Australia. In addition, there are some source areas held and funded by vine improvement committees or by their local industry groups – especially of rootstocks which have no commercial value to individual growers. The model proposed here allows for the new oversight body to work with these collections and industry bodies to develop options to maximise efficiencies, cost-savings and mutual benefits – eg by rationalising collections where there is significant duplication or insufficient demand to justify multiple plantings.

How should the model be funded?

What is the net benefit of adopting the model?

The benefits that accrue as a result of adopting this model include:

- Quicker access to desired planting material as a result of having a supply on hand leading to quicker responses to market signals
- Reduced risk of mis-identification of a variety and hence planting the wrong variety and incorrect wine labelling
- Improved quality of planting material (better performing, high health status)
- Opportunities for innovation and improvement in planting material through access to diverse range of genetic resources for breeding and selection trials
- Insurance against biosecurity threats by the availability of clean stock for replacing destroyed or infected vineyards

A full analysis of the economic impact of these benefits has not been done, although some specific examples have been given above. As a conservative estimate, if the combined effect of these benefits (including improved vine productivity, better market competitiveness, reduced costs of imports, direct losses, legal issues and shorter turn-around times to get back into production) was a 1% increase in the value of the Australian winegrape crop annually, this would amount to several million dollars. Once translated into wine, this effect would be multiplied approximately ten-fold.

The investment that has already been made in the establishment of the AVIA nuclear collection, the development of the Australian Standard for Grapevine Propagation and the updating of the National Register of Grapevines and Clones adds to the value of adopting the model, rather than taking no action, in which case the benefits of these major projects will be lost.

The total cost of implementing the model is approximately \$140,000 per year – including the contributions by state and commonwealth governments to the germplasm collections and the contributions of vine improvement schemes and others to the maintenance of the nuclear collections – a small fraction of the estimated benefits. Therefore there is a strong *prima facie* case that the benefits of implementing this model far outweigh the costs. The additional contributions of vine improvement volunteers in supplying material and overseeing local distribution systems, and of nurseries and grapegrowers as users (customers) of the system (ie through purchases of cuttings or rootlings) – are not factored in but are substantial.

Who are the beneficiaries?

Private beneficiaries

The benefits identified for the wine industry from investing in grapevine foundation assets *ultimately* accrue to individual grapegrowers and winemakers who plant with the best available, true-to-type and high health status planting material, as opposed to inferior, poor health status or potentially mis-identified material. Nurseries who obtain planting material through the system with assurances of its identity and health status are also private beneficiaries. These beneficiaries mainly benefit indirectly – via their ability to access best available planting material taken from source areas in the vine improvement scheme, which have been planted from material taken from the nuclear or germplasm collections. However, they benefit directly from access to the national grapevine register.

Public beneficiaries

A substantial component of the benefits of investing in the model are public benefits – ie they accrue to the whole industry and even the wider community as a result of having the whole collections available for current, potential and future need. The public beneficiaries are:

- The wine industry as a group, who all have access to the same benefits generated by the foundation grapevine collections, as well as improved business opportunities from a higher performing industry
- The next generation of grapegrowers and winemakers who inherit a better performing industry as well as access to foundation planting material
- Regional communities who benefit from a strong wine industry with local employment and tourism opportunities
- The wider Australian community through national economic benefits derived from having an internationally competitive wine industry

Summary of beneficiaries

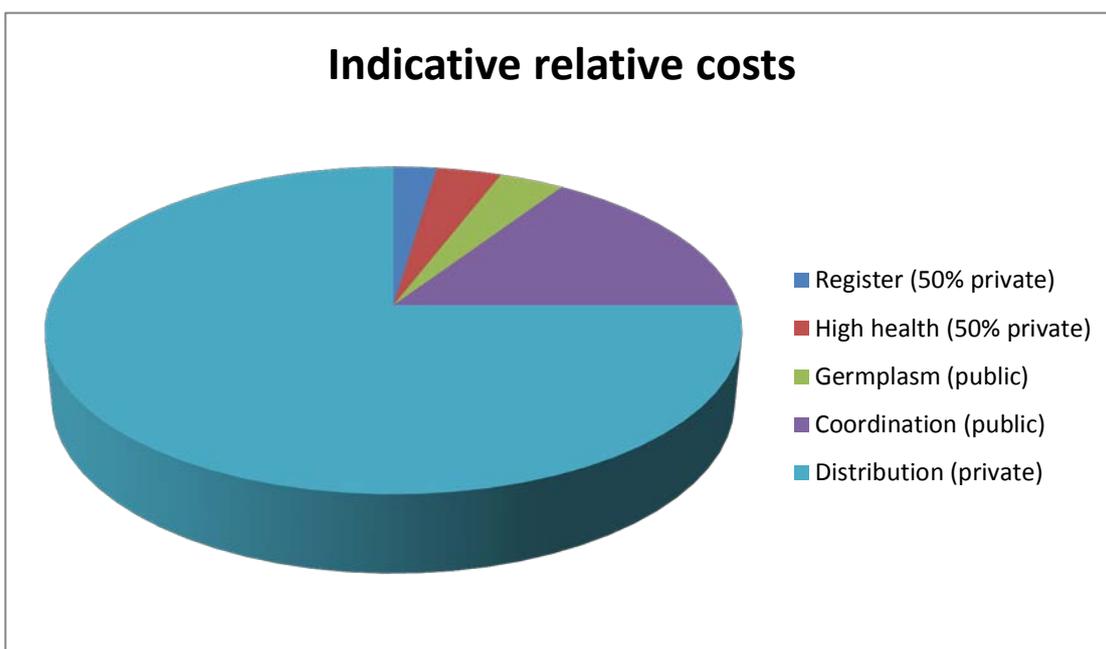
Benefit	Public (%)	Private (%)
Germplasm collections	75	25
Nuclear collections	75	25
National grapevine register	75	25
National coordination of system	75	25
National protocols and standards	75	25
Commercial collections	25	75

The funding proposal

The proposal is for public (industry and government) funding of the foundation elements of the model:

- the coordination role of the industry oversight body
- the establishment of the register (50%)
- support for high-health collections (50%) and
- maintenance of germplasm collections.

This is not a perfect model in terms of reflecting the relative benefits in the cost components; however, overall public funding is estimated to be around 25% of the total cost of the whole system – taking into account the private contributions made by vine improvement, nurseries and growers (purchasers of material and owners of source blocks) at the distribution end of the supply chain. This is illustrated on the next page.



Governments (state and commonwealth) are expected to continue to fund the maintenance of the two major germplasm collections identified in the model. Therefore **industry funding is only required for the coordination/industry oversight activity, the establishment of the register (in conjunction with private sources of funds – eg from nurseries or vine improvement committees) and the virus testing of the nuclear collection.** In the medium term, it is expected that these industry costs will be reduced as efficiencies and cost-saving opportunities are identified.

All large grapevine collections in Europe and the USA are funded by governments at levels ranging from 40% - 100%¹⁰. The majority of other (non-grape) perennial collections in Australia are funded by industry funds and government contributions through matched industry levy funds, research grants and in-kind support (land, labour). Most of these collection owners identify government funds as essential to their viability.¹¹

¹⁰ McMichael (2013) Summary of a review of grapevine germplasm collections in Australia Summary Report to GWRDC (Project Number GWR1112)

¹¹ Ibid.

Funding requirement

The table below summarises the *indicative* cost of the model per year for the first three years. The costing is based on information provided by current collection owners and commercially available information on the costs of virus testing, employment etc.

It is recognised that the cost of establishing the register may be significantly higher than has been estimated, depending on difficulties encountered with establishing standards for naming, identity verification etc and access to existing information. However, this activity can be a principal role of the Collections coordinator and therefore may be absorbed within the cost of that position.

The majority of the funding requirement is for the Collections Coordinator position. In the medium term, this may be able to be funded through joint arrangements between the industry bodies but in the short term it is assumed that industry (levy) funding will be required for this component.

Element	Industry funds (AGWA levies)	Other public funds (govt)	Private funds ¹²
System administration (industry oversight body and technical advisory committee) ¹³	\$7,000		
Collections Coordinator	\$100,000		
Establishment and publication of national register ¹⁴	\$7,000		\$7,000
Maintenance of high-health collections	\$10,000		\$10,000
Subtotal – industry levy funds	\$124,000		
Maintenance of germplasm (not including salaries of researchers) ¹⁵		\$20,000	
Total	\$124,000	\$20,000	\$17,000

The total funding required from industry levies is \$124,000 per annum for the first three years. **This amounts to less than 1% of the amount collected annually by the Grape Research and Wine Grapes Levy.**

¹² Eg from vine improvement, nurseries and growers (user pays component)

¹³ From AGWA operational budget

¹⁴ Costs likely to be higher in first year but reduce in subsequent years – this is an average

¹⁵ Paid for by State and Commonwealth governments

Establishing the new system

Implementation stages

The issues around vine improvement and foundation collections have been unfolding for over a decade. Implementation of a new system requires an initial set of decisions to be made within the national industry's governance framework. Those decisions will then guide subsequent implementation phases.

It is therefore recommended that consideration of the new system is taken in stages as outlined below.

Stage 1: halt the slide: take responsibility for action

The first and most critical steps are for the industry at a national level to take responsibility for the implementation of the new system and take immediate action to protect the existing foundation assets paid for with industry levies. Once this has been achieved, solutions that best address industry's short, medium and long-term genetic resource requirements can be developed.

Stage 1 actions are to:

- 1) Commit to the implementation of the model
- 2) Establish the industry oversight function within AGWA
- 3) Appoint a Collections Coordinator to support the implementation of the model and the achievement of long-term solutions
- 4) Negotiate short-term arrangements with Dareton and/or Monash collections for shared cost of maintenance of the identified varieties – including providing support for virus testing for 2014 and 2015
- 5) Commence negotiations with CSIRO and SARDI for MOU or similar agreements around germplasm collections addressing:
 - a. Industry access to material
 - b. Long term security of the collections
 - c. Communication of research outcomes
 - d. Maintenance practices and protocols

Stage 2: prepare the way for an effective national management structure

Once the coordination/oversight structure has been established and the issues determined, the second stage is to secure resources for ongoing strategic decisions regarding medium-term requirements and the best mechanisms for achieving the required outcomes. Ideally stage 2 would commence within 3 – 6 months of the initiation of stage 1 and be complete within two years.

Stage 2 actions are to:

- 1) Undertake a review of the varieties in the three principal collections: Dareton, Monash and Manjimup and determine the optimum list of commercially in-demand varieties that should be supported by industry at this time
- 2) Develop a protocol to review the collection(s) based on rolling trend data
- 3) Identify unique varieties in other collections in order to ensure no significant losses of genetic stock if those collections are closed.
- 4) Resolve an appropriate and sustainable virus testing regimen for high-health vines
- 5) Establish and publish a national register of varieties and clones in Australia
- 6) Prepare a five year plan identifying key issues to be addressed and desired outcomes and including a model for sustainable funding

Stage 3: find long-term solutions that respond to prevailing realities and future possibilities

Stage 3 should be the ongoing activities associated with the model – such as:

- 1) Ongoing review and promotion of the Australian standard and associated protocols
- 2) Maintenance of the accuracy of the register
- 3) Liaison with other parties in the system: collection owners, vine improvement, VINA etc and working to develop synergies between different entities and stakeholders involved in management and distribution of grapevine foundation resources
- 4) Implementation of rolling five year plan
- 5) Review of system and identification of opportunities for improvement to increase efficiencies, save costs, increase competitiveness etc. – including rationalisation of collections to remove duplication and streamline functions
- 6) Coordination and cost-sharing between the different vine industries.

Possible options that could be developed in this stage are:

- Modify the virus testing regimen in the Australian standard to a risk management approach that could dramatically cut costs of maintaining the status of the high-health vines
- Develop a distributed model for the maintenance of high health vines according to a list of current requirements – where the vines might be in a number of private and publicly held collections around the country under a supply agreement with the industry
- Look at incorporating reference vines of privately imported varieties and PBR-protected varieties in the nuclear collection on a fee-for-service basis
- Integrate the national register with the National Vineyard Database to support strategic planning for the whole industry; include identification of all vine improvement source blocks to help with biosecurity planning, traceback in event of a disease outbreak and faster responses to changes in planting demand
- Investigate the possibility that AWRI could take over the coordination role on behalf of AGWA in the medium term, if this role does not fit with AGWA's operating principles.
- Forge close links with one or more universities over the use of the foundation collections – eg research students could be given access to the collections for projects that would contribute to innovation as well as providing valuable practical work experience and increasing the profile of grapevine breeding, selection and propagation for future generations of grapegrowers and winemakers.
- Look into partnerships with other horticultural industries to create a hub of expertise in propagation, virus identification etc as well as operational efficiencies and economies of scale

RECOMMENDATION 7

That WFA and WGGGA support the staged implementation and funding of the model as outlined in this report to enable it to develop a foundation for an ongoing management structure that is flexible and responsive and can support the sector's overall performance and deliver value in the long term.

Appendix 1: membership of working group

Nigel Blieschke	Peter Lehmann Wines, PGIBSA
Jim Campbell-Clause	WA Vine Improvement Association
Andy Gordon	VINA, KC Vines and Rootstocks
Prue Henschke	Henschke, Adelaide Hills Vine Improvement, AVIA
Mike McCarthy	SARDI
David Nitschke	Riverland Vine Improvement
Lawrie Stanford	WGGA
Jenny Treeby	Australian Dried Fruits Association
Linda Bowes	Secretariat – facilitator
Sandy Hathaway	Secretariat

Appendix 2: mapping existing collections to the new model

The following is a list of the major collections that were reviewed by McMichael et al (2013). It should be noted that this does not include all private collections owned by nurseries, and that the NSW government collection and MIAVIS collection were not reviewed by McMichael et al but are included here for completeness.

	Existing collection	Location	Status in new model
VINE IMPROVEMENT COLLECTIONS	AVIA	Dareton, NSW	Proposed as a source of high-health material to be supported in the national model terms of virus testing
	AGFPS	Monash, SA (formerly at Kapunda)	Identified as a source of high-health material to be supported in the national model in terms of virus testing
	AHVII	Adelaide Hills, SA	Contains a small number of imported varieties. May be interested in negotiating to co-locate vines in national nuclear collection.
	RVIC	Monash, SA	Will continue as a viable vine improvement collection supplying commercial quantities of material to nurseries and growers
	VAMVVIA	Dareton, NSW	Likely to continue as a viable vine improvement collection supplying commercial quantities of material to nurseries and growers
	MIAVIS	Griffith, NSW	Not currently viable based on cutting sales. Has significant area of rootstock source areas currently being supported by the Winegrapes Marketing Board. May be interested in a strategic review of the need for these source areas and pooling of resources.
GOVERNMENT-OWNED COLLECTIONS	WA govt/ WAVIA	Manjimup, WA	Well-resourced collection that will continue to be maintained by the WA government and WA Vine Improvement. Acts as a “back-up” nuclear collection but does not have a wide range of material. Likely to be considered as part of the strategic supply of high-health material in the long term, particularly given its remote location (low risk in terms of a major disease outbreak in the Eastern states).
	CSIRO	Koorlong, Vic	Identified as an essential collection of germplasm material. MOU proposed for negotiation with Commonwealth government to ensure its sustainability and industry access.
	SARDI	Nuriootpa, SA	Identified as an essential collection of germplasm material. MOU proposed for negotiation with South Australian government to ensure its sustainability and industry access.
	Tasmania		Has been removed
	Queensland govt		Has been mothballed – likely to be removed
	NSW govt	Griffith, NSW	Not currently active. May be interested in negotiating to relocate any significant material to the national collection and possibly contribute funding to the national model.

	Existing collection	Location	Status in proposed new model
PRIVATE COLLECTIONS/IMPORTERS	Yalumba	Oxford Landing, SA	Significant private collection – will continue to supply commercial material particularly imported varieties to growers and nurseries.
	Agribusiness Research & Management	Busselton, WA	Number of private imported vines held is unknown. Business offers a range of viticultural consultancy services as well as vine supplies. Business unlikely to change as a result of implementing the new model.
	Binjara Nursery (formerly Chalmers)	Euston, NSW	Private nursery containing a number of proprietary imported varieties. Likely to continue as a private supplier of this material to industry.
	Viticlone Supplies	Dunsborough, WA	Private nursery likely to continue as a supplier of material to the WA wine sector.
	Brown Brothers	Milawa, Victoria	Small number of privately held accessions. Does not operate as a commercial nursery. Business unlikely to change as a result of implementing the new model.

It is hoped that all private collections would participate in the national model by registering their imported clones and varieties on the national register.