NSW Wine Industry

Research, Development and Extension Strategic Plan

Updated January 2018

NEW SOUTH WALES wine

Background

The first NSW RDE Strategic Plan was prepared in June 2016 after the inaugural NSW Wine Innovation Forum which was held in November 2015, as part of the WISCEA project. This was championed by Deb Hailstones and Darren Fahey from NSW DPI in partnership with the NSWWIA and Wine Australia.

This document is the next phase and comes after the second NSW Wine Innovation Forum, held in June 2017.

The Innovation Forums have served as an opportunity for the NSW Wine Industry to engage key personnel, across many technical disciplines and all regions to capture their perspective on the current RDE needs for the NSW Wine Industry.

The RDE priorities that have been identified cover operational and tactical areas through to strategic development initiatives.

The Innovation Forum has also captured areas for future extension, and research and development, across various existing sector programmes including the NSW DPI's Skills Development Program (SDP), and Wine Australia (WA) funded programs such as the Regional Program (RP) and Incubator Initiative (II).

Finally, several risks, issues and opportunities have been identified that will be useful to various sector stakeholders including: national bodies such as WA, WFA & AV, RDE providers and the state body – NSWWIA. These opportunities span many areas including operational, advocacy or other issues such as tourism, taxation, some of which fall outside the RDE frameworks, but they have been captured for completeness.



Overview of the Outcomes from IF2017 and the RDE Strategic Plan

The NSW Wine Innovation Forum in 2015 identified four high-level RDE themes that should be addressed as part of the national RDE framework. This was updated in 2017. These include:

1. Maintaining sustainability, profitability and biosecurity in the NSW Wine Industry through a strong RD&E network.
2. Improved vineyard performance
3. Growing the NSW wine industry by knowing the consumer
4. Managing RDE opportunities and outcomes

Included in each theme is a table of initiatives captured from the Forum. Common ideas were grouped together, as well as the perceived gaps across the relevant 'R, D, E' pillars. The Forum also identified opportunities for initiatives to be included in relevant programs such as RP, SDP, II or other avenues. Initiatives in green denote that there is already work underway with Wine Australia. Finally, some areas have obvious project opportunities and others require further development. Therefore, it may be appropriate to establish a few industry reference groups to assess these opportunities for potential future research initiatives

In addition to these key themes, several initiatives / opportunities span multiple themes and their importance should be acknowledged:

- Weed & Sucker Control and the use and impacts of herbicides – broad topic, many opportunities.
- Digital & Precision Viticulture – many areas, diverse opportunities, crosses over into virtually all aspects of vineyard operations.
- Sustainability – Entwine, metrics, opportunity to drive this as a state initiative.
- Vineyards of the future – looking ahead – varieties, design, how we do this.

Participants were excited by the opportunities that technology does and could provide going forwards, but at the same time see that many of the existing platforms that are used or those being developed do not necessarily 'talk' to the other systems that are used, thus requiring multiple data entry. There are also activities where metrics are not captured where there may be an opportunity to do so. In addition, there is significant data which is not being used or optimised at this stage. The opportunities for the collection and use of data and metrics should be a consideration when designing new projects and RDE proposals going forwards, especially in the sustainability and efficiency space.

Also in NSW, where there is a limited presence of corporate wineries and winery/grower relationships there is limited use of the corporate data collection systems e.g. Grapeweb/Grapelink which capture some of the data which could be shared across platforms. This presents an opportunity for a platform to assist growers with data collection for better record keeping, reporting and decision making.

Sustainability was a topic which generated considerable interest, with an update on the wine industry's sustainability program Entwine being presented. Again, as with the digital opportunities there is scope to make sustainability a much more integrated part of vineyard operations for the betterment of the both the vineyard and the vineyard business. There are many opportunities to develop & collaborate on projects that improve sustainable practices within the vineyard environment.

Looking ahead, there is interest in exploring alternative varieties, bespoke regional agronomy packages as well as vineyard design and operation opportunities. Again, this should be considered in the context of changing tools and opportunities.

With emerging signs that the global supply/demand balance is improving, consideration should be given to better understanding future demand requirements (market, price, varietal, style etc) to ensure that we are prepared for the next wave of production growth in NSW.

Research, Development and Extension Strategic Plan

Theme 1: Maintaining sustainability, profitability and biosecurity in the NSW Wine Industry through a strong RD&E network.

Why is this important?

It is vital that the NSW Wine Industry has a focus on sustainability, profitability and biosecurity to ensure a solid foundation to protect the industry's future. These areas need to be further developed and over time become integrated into routine business management, rather than being consider as an impost on business. For this to occur there needs to be a culture of RDE collaboration within the NSW wine industry and with local and interstate RDE institutions and commercial providers.

We must build a strong state-wide RDE network, that can overcome the tyranny of distance, diverse regional conditions and diverse crop value. It should also be cognisant of the full value chain.

There is an opportunity for NSW to gain some commercial advantage by widespread uptake of the wine industry's sustainability program Entwine.

Decisions making will be based on evidence from a strong RD&E culture that is responsive to the needs, opportunities and challenges facing the NSW wine Industry.

Strategic Objectives	Specific RD&E concepts
1.1 Foundations of industry 	• Maintain and strengthen biosecurity capacity (preparedness, detection, surveillance, skills, capabilities). • Build emergency response capacity in NSW regions through partnerships with specialists and government agencies in areas of risks (i.e. smoke taint or other taints, crop threats invertebrate or vertebrate, phenoxy herbicide). • Support the sustainable production of grapes and wine e.g. via the use of metrics and certification as per Entwine (or it's equivalent). • *Flexible vineyards (responsive to market, climatic and or economic imperatives, built on an improved resource base by an adaptive workforce).* • Build a strong culture of collaborative RDE, with within the NSW wine industry and with local and interstate RDE institutions and commercial providers. • Economic modelling of various inputs and actions e.g. water trading to assist with decision making, adoption of new practices, risk of non-adoption or change.

Theme 1: detailed initiatives

Issue	Con-cepts	R	D	E	RP	SDP/ SVH FD	II	Other	Comments/Project Concepts
Digital Viti	1							DPI Additional input	Lots of opportunity for projects – crosses over with many other areas. Keen to see more work here. DOV VitiTech?
Soils/Nutrition									RP Project with YANS? A layer to agronomic packages in the future? II –possible tool kit/package for this?
Sustainability	1								Entwine training and using the metrics. Regional working groups. Fund via RP or other– Landcare? NSWWIA to co-ordinate?
Energy Projects • On farm – tools to adopt • On farm – new innovations • New energy sources for tractors.	2.2 2.4	 X X X	 X	 X				OEH	Energy costs are rising FFCRC?
Utilising the Waste Stream • Using winery waste for human consumption and/or beauty/health products.	1 3.3	 X	 X						Opportunity for collaboration with food scientists ? FFCRC
Biosecurity • Phylloxera • Using Drones for biosecurity survey work e.g. phylloxera surveys. • Updates on what we are looking for in the field, risks etc…	1	 X X	 X X	X	X	X X			
Smoke Taint • What levels of smoke e.g. controlled burns, stubble, etc., will impact on fruit & vineyards.		X		X					
Vineyards of the Future – explore the options for development. • Vines, trellis, Irrigation, ability to mechanise e.g. cane strippers, CSIRO vines			X					NWGIC DPI	Big project – lots of potential output. Needs an industry partner.
Dwarfing Rootstock/Variety Demo Site Trellis/Row spacings/pruning techniques			X						



Theme 2: Improved Vineyard Performance

Why is this important?

NSW has 16 wine regions which are diverse in terms of climate, variety mix and crop value. Regional differentiation and specialisation offers an attractive opportunity for NSW to identify and exploit niches for its products, both domestically and internationally and hence grow the NSW wine industry. Stakeholders are more likely to adopt RD&E if it is tailored to their needs, thus some RD&E programs will be developed and executed within regions to explore regional solutions and opportunities.

In addition to regionally based strategies and programs there is an ongoing need to pursue more efficient vineyard management for greater sustainability and profitability. There are numerous areas where this can be explored including:

Strategic Objectives	Specific RD&E concepts
2.1 Optimise viticultural practises and germplasm to enhance regional performance and differences.	• Identify and introduce varieties optimised for individual regions of NSW (with respect to performance, pest and disease resistance, drought tolerance etc), including through the use of genomics • Develop specific agronomic tailored to different climatic conditions, regions and/or varieties. • Develop production specifications and/or guidelines to satisfy certain end use requirements. • Understand the diverse regional conditions to improve grower decision making and in turn industry profitability and sustainability – at a regional level.
2.2 Develop and deliver efficient and sustainable vineyard practices.	• Develop better tools and techniques for the management of surplus vine growth i.e. suckers. • Explore and evaluate alternative production models (ie organic). • Adopt vineyard sustainability projects and programs and utilise metrics to drive innovations to assist with developing better practices.
2.3 Develop and deliver regionally-optimised pest, disease and weed management options	• Explore “New” chemistries e.g. biologicals • Manage fungicide resistance. • Revise existing Integrated Pest Management programs, to encompass more recent RDE including through new cultural, biological control options and agrochemicals. • Explore & develop novel PDW management tools.
2.4 Develop, adopt and adapt new technologies to minimise inputs and optimise outputs (Undertake these types of projects in collaboration with other partners.)	• Explore novel assessment tools for disease, yield and early detection of biosecurity risks. • Explore the opportunities for digital tools to enhance/support agronomic decision making e.g. pest and disease management, heat management • Explore and evaluate advances in vineyard mechanisation – for example drones, robot swarms, GPS self-drive harvesters and tractors. • Explore the opportunities for precision and digital viticulture to improve vineyard efficiency, sustainability and profitability. • Evaluate novel techniques and best practice for managing the waste stream (e.g. winery waste water, marc, packaging etc…)



- Evaluate the opportunities for “Big Data”.
- Understand the opportunities and risks with genomics, plant breeding, GMO’s etc…

Theme 2: detailed initiatives

Issue	Con-cepts	R	D	E	RP	SDP/ SVH FD	II	Other	Comments/Project Concepts
Weed & Sucker Control / Herbicide Use • Fleabane (glyphosate resistance) • Glyphosate for sucker control • Getting away from chemical weed control. • Herbicide alternatives to Sprayseed in the season. • Weed/Sucker Control – management strategies, novel solutions.	2.2 2.3	 X X X X X	 X	 X	X	X	X		Trial other cultural controls. Trial other chemistry – non viti? Potential RP, SDP and II projects. Propose an Industry Reference Group for this area. Trial different spray regimes, mechanical options etc…
Bird Control • Strategies • Lasers?		 X X	 X	 X	 X	 X	 X		Justin Jarret's book and other older research to be revisited. DF II - Lasers may be an opportunity.
Pest and Disease inc Agchem • New disease models for different Australian Regions (other than hot irrigated) e.g. update 10:10:24 • Spore Trap Research – expand current work and into more areas – PM, DM, Bot. • Disease models using weather models for forecasting disease events. • Info on preventative V curative chemistry • Info on systemic V contact chemicals	2.2 2.3 2.4	 X X 	 X X 	 X X					
Digital Viti • data being exportable to multiple platforms e.g. Entwine, spray diaries etc… • Develop sensors and robust tools to link in with LoRaWAN • Sensors to measure yield using drones. • Big Data Projects • Using drones for vineyard survey work – biosecurity/health/disease monitoring. • Regional use of drones for vigour mapping. • Precision nutrition	2.2 2.3 2.4	 X X X X X	 X X X X X X	 X X	 X			DPI Additional input.	Lots of opportunity for projects – crosses over with many other areas. Keen to see more work here. DOV VitiTech ?
Vineyard Practices	2.2								Robotic pruning – OS? Watching brief?
• Mechanical Bunch thinning • Mechanical undervine weeding. • Robotic Pruning • Sorting out botrytis infected berries @ the point of harvest.	2.3 2.4	X X X X	X X X X	 X X	 X				
Soils/Nutrition • Cover crops to improve specific soil problems. • Workshop on regional on soil nutrient health and best use of fertilisers. • YANS – understanding the numbers and how we might use that for vineyard nutrition	2.1 2.2 2.4	 X X	 X X X	 X X X	 X X X	 X X			RP Project with YANS ? A layer to agronomic packages in the future ? II – could be to make a tool kit/package for this ?
Sustainability • Entwine – training • Using the metrics • New sustainability opportunities on farm	2.2 2.4	 X	 X X	 X X X					Entwine training and using the metrics. Regional working groups. Fund via RP or other funds – Landcare money ? NSWWIA to co-ordinate?
Energy Projects • On farm – tools to adopt • On farm – new innovations • New energy sources for tractors	2.2 2.4	 X X X	 X	 X				OEH	Energy costs are rising FFCRC ?
Adapting from other industries • Practices, Ideas,Tech & Machinery			X						
Climate • Effects of UV levels on ripening and phenolic profiles. • Exposure to light and heat and the impacts on berry flavour development – when is Shiraz terroir project, love to extend sites and varieties involved key time to leaf pluck? • Weather prediction – heat, hail • Can we prevent hail damage in the vineyard?	2.1 2.2 2.3 2.4	 X X X	 X X X	 X					
Assessment of New and Alternate Varieties	1	X	X	X	X	X		NWGIC?	In the regions plus agronomy packages. Assess multiple clones of each ?
Vineyards of the Future – explore the options for new vineyard development. • Vines • Trellis • Irrigation • Ability to mechanise e.g. cane strippers.			X					NWGIC DPI	Big project – lots of potential output. Needs an industry partner.

• CSIRO vines									
Dwarfing Rootstock/Variety Demo Site Trellis/Row spacings/pruning techniques			X						
Explore the notion on Terroir on a site and regional level.		X			X				
Linking varieties and blocks to specific markets	2.1	X	X						

Theme 3: Growing the NSW wine industry by knowing the Consumer

Why is this important?

The industry needs to strive to understand consumer behaviours to meet market demands.

This theme focuses on both 'end consumers' (wine shoppers and drinkers) and also 'customers' (retailers) knowledge in this field will help producers understand how they can influence product outcomes in order to meet consumer demands and or through effective marketing operations.

The NSW wine industry can capitalise on this new environment by understanding its consumers and customers, and satisfying their needs in terms of wine characteristics, points of sale, desire for backstories and ability to create memorable experiences etc

Strategic objectives	Specific RD&E concepts
3.1 Increase consumption of and price for NSW wine by delivering the best possible experience to the consumer 	• Analyse impacts on the industry of health regulations • Understand what consumers want in wine – characteristics, stories, alcohol levels • Explore whole of flavour wines (how to produce and how to promote) • Structure wines to match consumer need • Create local/regional/varietal stories and experiences for sommeliers (i.e. NSW is not a story, an alternative is 'pinot from a cold climate') • Investigate small batch winemaking • Investigate alternative winemaking approaches • Investigate emerging economies and the opportunities surrounding new markets (ie India, China etc…) • Strengthen the focus on the domestic market within NSW. • Explore the opportunity for sustainability to be part of the NSW story.
3.2 Increase consumption of and price for NSW wine through influence	• Target influencers who can help to sell industry's story (now and into the future) • Work with people we are not already working with – create new trends • Use multiple social media channels to increase industry exposure wine sales consumption and price • Improve marketing and product placement as guided by trends identified by World Advertising Research Centre (WARC)
3.3 New opportunities	• Explore the science behind synthetic food and its applicability to and opportunities for the future of wine production. • Explore other value-added products that may come out of the vine/wine value chain e.g. grape honey.

Theme 3: detailed initiatives

Issue	Con-cepts	R	D	E	RP	SDP/ SVH FD	II	Othe r	Comments/Project Concepts
Utilising the Waste Stream • Using winery waste for human consumption and/or beauty/health products.	1 3.3	X	X						Opportunity for collaboration with food scientists ? FFCRC
Moisture Sensors for vines (as opposed to soils). Leaf function Sensors	3.4	X	X	X					
Impact on new players on the retail sector e.g. Amazon		X							
Understanding the consumer		X							
Linking varieties and blocks to specific markets	2.1	X	X						

Theme 4: Managing RDE opportunities and outcomes

Why is this important?

At both the 2015 and 2017 forums there were areas highlighted as RDE priorities where it has been flagged that RDE that has been completed or is currently underway addressing these areas.

There is a need to ensure that industry is

a) aware of current RDE that is underway, and
b) ensure that completed RDE is extended or accessible as required for use by industry.

There is an opportunity build extension packages for some of the identified areas and to then extend then within with planned extension programs e.g. the Regional Program, Skills Development Program etc… or via other industry platforms e.g. webinars, websites etc…

Looking forwards it is vital that there is greater industry engagement in project design and review to ensure that the research community understand the operating environment that growers work within and to ensure that opportunities for even better outcomes are not missed. Digital and sustainability opportunities and outcomes, as well as economic assessments should also be explored and assessed for inclusion in all new project proposals.

Ideally where it is appropriate, projects will have an extension component build into them. This may include both technical information as well as economic information regarding adoption and implementation, compared with alternative or routine practices, sustainability metrics etc….

Strategic objectives	Concepts
4.1 Identify, translate and effectively extend existing R&D with potential to deliver improved practises and knowledge to the NSW wine industry	• Catalogue, assess and summarise research already done and currently underway • Develop compelling businesses cases to support the adoption of research. Conduct economic analyses including what the cost is of not adopting. • Translate research to improve adoption • "Do our own research" – principles, practises, costs of applied R&D on-farm Provide business training (in conjunction with Regional Development Authorities or existing training packages)
4.2 Increase industry involvement in RDE project planning and review.	• Create industry reference groups for projects (or suites of projects) to ensure that the research community better understand how growers/winemakers operate and may use the research. The aim is to ensure that opportunities are not lost when a project is carried out i.e. aspects of the project may need to shift or have some inclusions that ultimately enhance the research outcome and will provide greater benefit and potentially adoption.

Theme 4: detailed initiatives

Issue	Con-cepts	R	D	E	RP	SDP/ SVH FD	II	Other	Comments/Project Concepts
Economics • Cost/benefit tool – the ROI, the risk of not doing something. • Case studies of where value/profit has been added by adoption of RDE.			X X	X X					Maybe old PAMAUSVIT tool could be revisited?

Opportunities, Risks and other initiative - Opportunities

Issue	NSW WIA	NSW Govt	WA	WFA	Other
Signage for regions – biosecurity and tourism	X	Local & State Council/ RMS/De stination			
Digital Divide – internet and connectivity	X				NSW Farmers Assn
Tax	X			X	
Sustainability • Entwine – opportunity for NSW to embrace and use as part of our message. Also create regional stories from Entwine and networks through working together. Regional initiatives. • Energy – alternatives, cost savings, message.	X X				
Engaging with gatekeepers?? Trade or RDE?		X			
EXPORT/PROMOTION/TOURISM • NSW - More telling of our grower and R&D stories, etc.. • Sustainability – potential story • Export V inbound tourism • Development of inbound tourist hubs • Help drive exports • Help with exporting small quantities • Working with Destination NSW • ACT/NSW Govt - Promotion of Canberra? • Cellar Door location restrictions.	X		X		
Bulk purchase of FOSS machines • Ability for more analysis which in turn also means more info for making decision and potentially more research partners/adopters of science that needs data for decisions.	X				
IR/Labour Costs • Overtime rates in vineyards. • Piece rate for pruning.					
Chemical Use • Impact on Vine Health • Chemical Trespass (Phenoxy Herbicides) • Mechanism for reporting spray drift and impacts on vines. • Flexible chemical use under NSW Chemical Legislation e.g. can't do anything other than what is prescribed on the label, no off-label use if permitted.	X	X EPA/DP I	X		NSW Farmers Grains Resellers
Travel Bursaries for growers			Nuffield		
AWAC Workshops', Can we host a NSW event	X			AWRI	

Risks

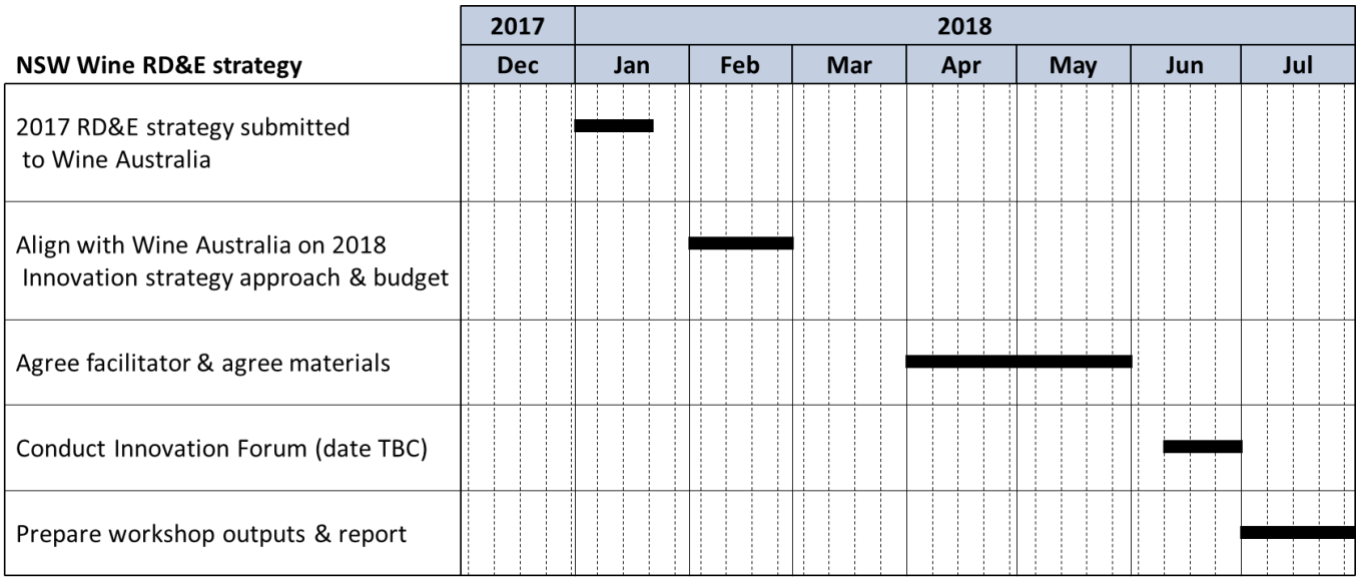
Issue	Comments
Workforce/Labour/IR • Aging • Lack of vineyard managers • Lack of skilled staff – vyd • Lack of good contractors Skill Sets • Business skills • Governance skills • Tech Skills	• Issue both now and looking ahead to potential industry resurgence. • Contractors - Market Driven (?) and same issue of lack of good labour. • Labour costs are an issue. • Succession planning – lack of. • Attracting young people. Within regions there is a need for governance training to equip people for regional assns. And potentially state and national roles.
Grape Shortage	
Germplasm / Heritage Vine Material	Old vineyards which may be in decline are at risk of removal – many may hold unique vine material on own roots. Can we preserve this before it is lost ? Source blocks ?

Other initiatives

SDP	Regional – Great NSW	Regional - Riverina	Incubator
• Sparkling workshop (Tumba/Sthn Highlands) • Weeds – ID, management	• Entwine Training • LORaWAN demo in Vyds. • YANS project • Tech Field Day – robotics, autosteer, GoPros etc… • Matching Alternative Varieties to NSW Regions	Entwine Training	• Glyphosate for sucker control (New England) • Alternative Varieties • Bud fruitfulness and 1st bud necrosis (Orange)

Proposed approach for NSW Wine 2018 RD&E Innovation Forum

In November 2017, follow up review of the NSW Wine RD&E strategy was conducted in which identified further opportunities to improve the deliverables from NSW to provide better input into the national RD&E agenda. NSW Wine is proposing to conduct an externally facilitated Innovation forum in 2018 to develop a more comprehensive & prioritised set of recommendations. This will enable Wine Australia to better understand the priorities from NSW which can be more easily collated with the needs of the other states to build the national RD&E framework.



NEW SOUTH WALES wine

Appendix

RDE Landscape

The RDE landscape within NSW and Australia are intertwined with a crossover of state and national funders and RDE providers. Most providers work both independently and in collaboration on selected projects.

On a national basis Wine Australia is the primary funding body for grape and wine research, with levy funds and associated matching funds being distributed via this entity. WA partners with various institutions and agencies to support RDE.

In NSW the key grape and wine RDE centre is the National Wine and Grape Industry Centre (NWGIC) which is a partnership between Charles Sturt University, the NSW Department of Primary Industry and the NSW Wine Industry Association. (A new agreement is currently being negotiated.)

NSWDPI provides direct industry support with the provision of two Development Officers for Viticulture (DOV's) and these roles are an integral part of the RDE platform for industry. They conduct applied RDE through the WA funded regional program (Greater NSW and Riverina) and deliver extension via the skills development program (SDP) which included the Spring Vine Health Field Days and other workshops. The NSW Automatic Weather Station network and Vinewatch Newsletter are also DPI initiatives which supports the industry, primarily through the growing season but as required outside of this period. They also provide significant additional direct and indirect support via other programs and their investment in the NWGIC.

The AWRI provide RDE support to NSW through their national RDE program as well as via the Help Desk and an Emergency Response capacity in the event of a major issue e.g. smoke taint. They are also key providers in the areas of agrochemical support and sustainability, as the custodian of the Entwine sustainability program. The AWRI are regular visitors to NSW with the delivery of the AWRI Roadshows being a key extension event on a biannual basis in most regions.

The NSW Wine industry also interacts with other RDE providers such as Macquarie University, University of NSW, SARDI as projects and opportunities arise. Many regions support the RDE programs of the NWGIC, AWRI, SARDI etc... with the provision of grape and wine samples to provide both regional and national content and context for RDE programs.

