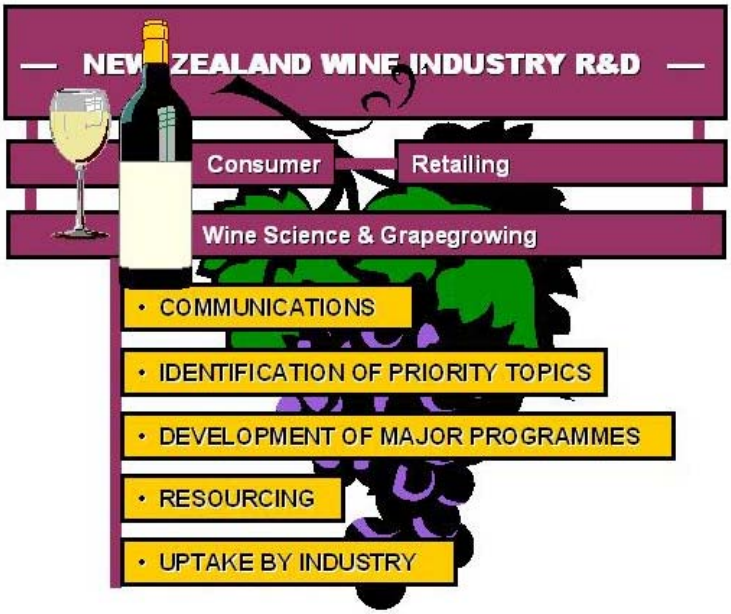
New Zealand Winegrowers
Research Committee

Research & Development Strategic Plan



EXECUTIVE DOCUMENT

December 2005

New Zealand Winegrowers Research Committee

Research & Development Strategic Plan

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Section 1: Explanation and Foundation

1.1. Vision & Mission Statements

New Zealand Winegrowers

Vision: *Sustainable Growth for New Zealand Wine*

Mission is to be:

> *The national organisation representing, promoting and researching the national and international interests of the New Zealand wine industry and New Zealand grape growers and winemakers.*

New Zealand Winegrowers Research Committee

Mission: *To provide and promote an innovative technical basis for New Zealand to be the leading producer of highly distinctive premium quality wines.*

1.2. Background

Timeline

1995

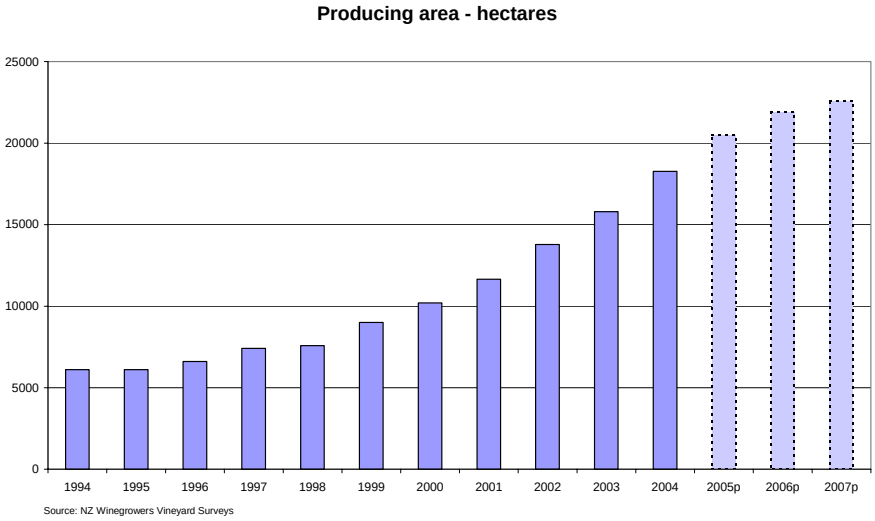
- Research Committee established by NZ Grapegrowers Council and Wine Institute of New Zealand (wineries)
- Then had a 48 page 'wish list' without clear guidance for prioritising
- Narrowed 'wish list' to 6 main areas and type of projects

2002

- *New Zealand Winegrowers* formed as a unified industry body representing grape growers and winemakers
- Provided a more simple management structure for the industry research function

2005

- Levy system provides investment in R&D currently ~ $950K. Five-fold growth in research funding in the past decade
- Levy payment growing, but must also fund generic promotion of New Zealand wine
- Industry grown dramatically, both growers and wineries, over past decade added one new winery every 14 days
- Export sales increased:
  - 2005 export volumes exceeded domestic volume for the first time
  - Price per litre decreasing not all due to exchange rate
  - Sauvignon Blanc dominates (70% of exports)
  - Pinot Noir 3rd most planted variety but just behind Chardonnay



Key R&D developments

- Virus: confirmation of mealybug as major vector, and improved emphasis on testing, planting material for virus
- Botry-Zen new Biological control agent late 90's
- Botrytis infection period models developed, and improved canopy management
- Sustainable pest management, in particular improved biological control of Leafroller caterpillars
- Development of *Sustainable Winegrowing New Zealand*® programme
- Creation of Marlborough Wine Research Centre
  - significant private wine company direct investment in public research
  - FRST funding of Sauvignon Blanc Aroma programme July 04; $9.6 million over 6 years; $4.9m in kind giving $14.5m total funds
  - new level of national collaboration with University of Auckland, HortResearch, Marlborough Wine Research Centre and Lincoln University.

1.3 R&D Issues

- Botrytis: the major fungal grape disease resulting in considerable crop losses and premature harvesting; the control of which leads to the majority of chemical residues in NZ wine.
- Residue free wine: the objective is to develop disease management programs resulting in residue free wines.
- Virus: major long term disease threat to industry
  - rate of spread of leafroll virus Type 3 faster than elsewhere
  - shortens season and has an effect on wine quality
  - falling economic return shortens vineyard longevity.
- Consistent grape supply
  - need improved understanding of sources, and management of variability particularly in vineyards.

- need to understand vineyard factors affect different grades/styles of wine
- synchronising maturity for harvest
- must be able to understand drivers that influence quality; this concerns preharvest management; water; nutrient; crop load.

- Soils and the environment
  - need improved understanding of the relationship between the soil environment, plant health and performance
  - maintaining high quality ecosystems.
- Fruit and wine compositional attributes (Qualities)
  - need to elucidate aroma / flavour attributes of major grape varieties
  - need improved understanding of reasons for aroma/flavour of Sauvignon Blanc; distinctive full frontal fruitiness
  - need to define other quality compositional attributes of New Zealand wines e.g. tannin structure.
  - need to understand the relationship between grape attributes and eventual wine attributes.
- Product specification
  - development of production systems to produce defined wine styles fit for defined purposes (e.g. specific markets, various price points).
- Efficient and sustainable production systems
  - Energy efficient processes in vineyards and wineries
  - Improved processes for labour management within vineyards
  - Improved information technology systems
  - Implementation and use of new technologies.

Section 2: Demand Analysis and External Variables

2.1. Customer Variables

STAKEHOLDERS (CUSTOMERS)

- Consumers and Trade
- New Zealand Winegrowers Board
- Grapegrowers (800 +/-)
- Winemakers (524) Buyers → consumers
- Funders; FRST, MAF Sustainable Farming Fund, AGMARDT, etc.
- Providers: CRIs, Universities, independents.

2.1.1. Providers

WRC perception of CRIs, Universities, independents is

- that providers haven't understood priorities or funding methodology
- industry structure different to other parts of horticulture sector
- progress is slow and expensive, and sometimes not well targeted
- wine sector needs to be seen as attractive to work with i.e. good science to be done in the sector, with good opportunity for gaining third party funding
- Providers often want to retain IP as does wine industry; key issues are access to knowledge and potential revenue from development of resulting new technologies.

2.2. Environmental Variables

Factors related to the "business environment" that will have a strong influence on wine business:

- Exchange rate fluctuations.
- Labelling regulations in different markets.
- Requirements (or otherwise) for traceability.
- Globalisation and wine business unit size.
- Level of Investment: annually 1,500 to 2,000 hectares of grape growing land is coming into production (average past 6 years). 1,000 hectares of land requires industry investment of about $250m to get related wine to market.

2.3 Competitive Variables – specific to the wine industry

Factors related to the "competitors" that will have a strong influence on wine business:

- Small size of NZ industry on global scale, and relatively specialised production
- Fundamental importance of brands as integral part of the product offer
- Importance of country and region of origin to product branding
- Relative to competition, whilst New Zealand achieves a high price point, its quality is of good value. Some countries e.g. South Africa, are lifting their average price and quality.
- Relatively low R&D investment level – but increasing.
- New Zealand has a potential lack of research capability, researchers and capability in the sector to use research results.
- As New Zealand production volume increases, there may be pressure within New Zealand Winegrowers to divert resources from traditional research to promotion to penetrate markets.

Section 3: S.W.O.T. Analysis

3.1 Strengths

Profile & Communications

- Relatively small industry – without fixed attitudes to most things.
- Have world recognition for at least one wine style.
- Industry is large, by New Zealand standards, and is destined for sustained growth
- Industry has international profile – for fruit-driven styles
- Historical good research; recognised as benefiting industry.

Organisation / Structure / Processes

- We have a narrow focus on major issues
- Developing collaboration between partners
- Can provide single industry voice for funding bodies

Resources/ Skills / Funding

- Relatively young average age – many new entrants vineyard/winery – enthusiasm
- Positive reaction in industry and amongst research partners to expansion
- Total investment in wine R&D has gone from less than $2 million (3 years ago) to now approximately $5m (industry $300k cash MWRC, $800k NZ Winegrowers).

3.2 Weaknesses

Profile & Communications

- Difficult to get effective consultation with the industry
- Poorly enunciated research strategy for industry stakeholders, and research providers
- Poor understanding by industry of the value and role of research
- Poor utilisation of the processes for effective technology transfer
- Identifying and communicating past and present achievements → via various media; e.g. papers, articles, presentations, demos, etc.
- FRST: right now we do not have relationship / direct contact. N.B. major projects have a long lead time.
- Need a strategic base with a successful history and achievable value-add outcomes.

Organisation / Structure / Processes

- Voluntary nature of portfolio management, lack of resource (including time)
- Lack of focus on large research programmes
- Lack of support to NZW Science and Innovations Manager.

Resources/ Skills / Funding

- Fragmented science community to deal with – time factor.
- Small research fund, relative to the size of the industry.
- Present R&D management capacity is close to its limits in terms of commissioning research tasks and managing liaison with research Providers.

3.3 Opportunities

Profile & Communications

- Improve the overall technological understanding and capability of the industry
- Build on New Zealand's credibility as a producer of distinctive premium quality wines, including a wider range of varieties and wine styles.

Organisation / Structure / Processes

- Establish New Zealand as the international centre-of-excellence for specific wine industry related research areas.

Resources/ Skills / Funding

- Expand research activities into other wine styles and new technologies.
- Provide relative stability in industry related research funding.
- Develop recognised cells of expertise.
- The arrival of major corporate owners *increases* facility and support for co-operation / industry good R&D.
- Lift the level of science related to the industry, and generate increased associated third party funding.

3.4 Threats

Profile & Communications

- As export volume increases, importing countries may look more closely at non-tariff barriers to reduce the impact of NZ product e.g. demanding nil residues.
- Our lack of understanding of drivers of quality could result in either reduced quality over time, or competitors matching or surpassing New Zealand's offer.
- Lack of “runs on the board” by WRC and research community, could result in reduced support from industry Levy funding.

Organisation / Structure / Processes

- Lack of readiness to respond to change in environment or introduction of new pest or disease, could result in poor crisis management.

Resources/ Skills / Funding

- Quality focus of industry requires technical input in a marginal climate
- The arrival of major corporate owners *reduces* facility and support for co-operation / industry good R&D.
- Continuance of short and long term programmes will be reduced if momentum is not maintained.
- Failure to build on current funding successes could result in loss of interest from Research Providers and subsequent loss of research capability/capacity
- Industry focus on increased sales could result in transfer of Levy funding to marketing and market research, away from current research objectives

Section 4: Strategic Conclusions

4.1 Key Issues

Uptake and Prioritising

- Research topics need to be outcome focussed → to be **practical to industry** (but individual programmes can be wide ranging).
- Outcomes e.g. cost of production, are important to Growers

Prioritising of Major Programmes

- Different models / relationships / partnerships have added value i.e. **not all one model**.
- Need to **align R&D strategy with wider industry plan**:
  - Market access and maintenance thereof
  - Profitability
- Need an integrated view to suite of programmes (value / supply chain)
- Need to also have companion 'applied' projects; non-FRST and primarily industry funded.
- Need to develop and harness technology capability in R&D community we have available to us
- Need system that allows more flexibility and speed in response to emergency issues, e.g. stunted vine growth.

Communications

- Opportunity to enhance recognition of NZ Wine science programmes; to link with international science and to underpin NZ Wine science appreciation.
- Values: to underpin 'positioning'.
- Need to have **different messages for different customers**
  - Programme messages to Providers
  - Topic messages to Growers
  - with a generic messages to the wider market

  Note: for FRST, message should focus on impact to/on New Zealand
- Need to recognise evolution of clean / green being taken to environmental and compositional aspects

Resourcing

- Need definitions of roles and responsibilities of Portfolio managers
- **Resourcing of management structure** to commission and manage liaison with research is a limitation

Major Programmes

- **Major programmes** represent a vehicle to get funding and people focussed. It is about critical mass.
- **Provider alignment** → optimising skills → synergy to maximise potential (ask them to do some of the thinking – and **make inputs to the process**).

Uptake by Industry

- **Industry uptake** – which requires investment in approaches to insure basic technology transfer, education and training to bridge the gap between research outputs and industry practices.

4.2 Critical Success Factors

- COMMUNICATIONS – must be a two-way process encouraging active engagement of industry, to both guide the research programme, and inform industry of progress and development of the research programme.
- PRIORITISING – to provide a dynamic platform to guide the overall direction of the research programme.
- MAJOR PROGRAMMES – to ensure most efficient deployment of industry and research provider resources
- RESOURCING OF STRUCTURE – to ensure industry provides professional management of the research process
- UPTAKE BY INDUSTRY – to ensure research outputs are translated into appropriate systems for industry adoption and application.

4.3 Objectives

The **Mission** (what we want to achieve) is:

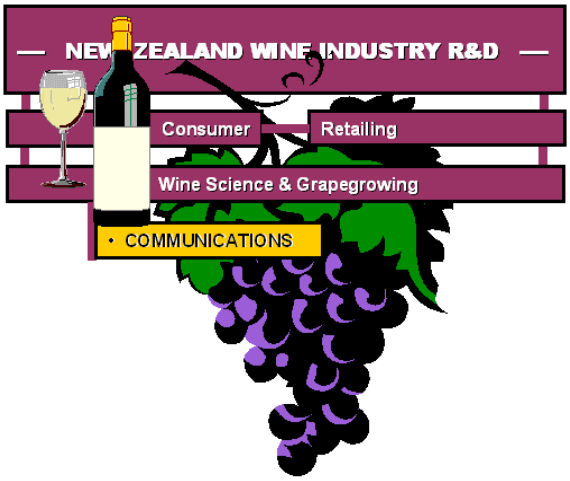
> ***To provide and promote an innovative technical basis for New Zealand to be the leading producer of highly distinctive premium quality wines.***

The objective of the WRC is therefore to support this Mission by implementing this R&D strategy that:

1. Has an effective communications programme
2. Aims to develop a method for effective prioritising of available resources
3. Has a clear focus on the significance of major programmes
4. Seeks to ensure that the programme is appropriately resourced
5. Has a clear focus on developing processes for industry adoption of research findings.

Section 5: Strategy

Objective One: Communications



For the purposes of this strategy, communication is treated as distinct from industry uptake which includes technology transfer and related activities. Communication is about the scope, form and knowledge discovery of the programme. It is about keeping the industry informed about the research programme and providing opportunity for comment. It is also about providing feedback to the researchers on industry opinion, and providing formalised input to development of research priorities (*Objective 2*).

The industry research programme has undergone significant growth and development, and the nature of relationships with key research providers has also changed. The research programme is complex and understanding the programme and all the interrelated activities in its entirety is becoming more difficult. The programme is also providing an increasing amount of information for industry stakeholders.

Industry knowledge and perception of the programme is not as good as it should be, and this strategy aims to address this. Broader knowledge of the research programme is also important for wider industry stakeholders and the research community. This will also be addressed.

FOCUS

- Need to have different messages for different customers
  - *Programme messages* to Providers
  - *Topic messages* to Growers
  - with generic messages to the wider market
  - impact to/on New Zealand funding agencies
- Opportunity to enhance recognition NZ Wine science programmes; to link with international science and underpin NZ Wine science appreciation.
- Communications programme will support the Mission 'positioning' of being internationally recognised as the leading producer and marketer of highly distinctive premium quality wines.
- Quality wines supported by a quality research programme

CONSIDERATIONS

- Each major action involving the WRC will include Communications objectives and actions.
- The need for Communications is also important to Science Providers.
- There needs to be co-ordination with other communications/ communicators to /in NZ wine sector.
- Communications need to provide information on plans, progress and activity, as much as on outcomes.

- Development and implementation of effective communications will require a different skill set to those traditionally thought of with respect to research reporting, in particular different to those associated with technology transfer.
- The Communications 'Game Plan' is to integrate this communications capability and capacity into a programme managed by NZ Wine and its WRC.

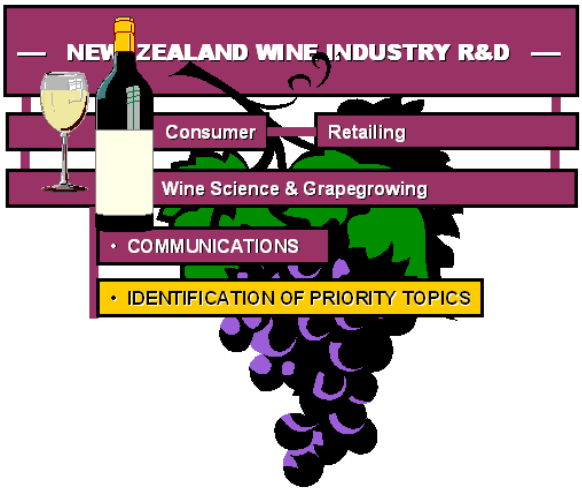
ACTION REQUIRED

Further consideration and development of an industry research communication strategy is required. This should be considered by a team including key stakeholders; inclusion of people with specific skills in the communications area is required. Integration of WRC communication strategies with those of other stakeholders in the research programme will be vital.

Resourcing of a well constructed research communication programme should be considered alongside other resourcing issues addressed in Objective 4.

Objective Two: Identification Of Priority Topics

During the development of the strategy, seven high level objectives were refined. These objectives provide a guide to the scope of research activities of long-term strategic interest to the industry. They are placed in a supply chain order rather than a hierarchy of importance, and are the "yardsticks" by which the WRC will judge the "fit" of any research proposals. It is anticipated that major research programmes may contribute to more than one objective.



1. *Wine Styles:* To provide industry with information to assist in the development of wine styles with reference to specific consumer demands.
    - Consumer preference studies, with reference to sensory properties, including preferences by market and variety
    - Reduced alcohol – with specific reference to health properties and wine balance
    - Understanding and avoiding premature wine ageing, and retention of fresh fruit characteristics

2. *Characterisation*: To characterise the quality attributes of grapes and wine; and develop appropriate research and industry tools to quantify them.
    - Understanding the compounds that give rise to attributes such as aroma, flavour, mouth feel and colour
    - The molecular aspects of the generation of these compounds and their relative abundance and impact
    - Improving understanding of sensory evaluation techniques to improve the quantitative power and sensitivity of these tools

- Development of rapid and inexpensive tools for the objective assessment of quality attributes
- Improved understanding of microvinification techniques and the relationship to commercial wine production

3. *To develop systems for the production of wines free from agrichemical residues.*
   - Development of non-residual natural product fungicides
   - Improving conventional programmes for non-residual wines
   - Improved vineyard systems to reduce requirement for agrichemical use, including modification of bunch architecture
   - Improved wine processing systems to eliminate residues

4. *To develop systems for the consistent production of grapes of specified qualities with synchronised maturity attributes and wine of specified quality*.

   Grapes
   - Ripeness(es) management tools to achieve targeted grape composition
   - Managing variability in vineyards and vines
   - Production systems resulting in consistent yields
   - Managing external impacts such as birds

   Wine
   - Conversion and enhancing of grape potential to wine
   - Wine processes to minimise requirements for intervention in wine making

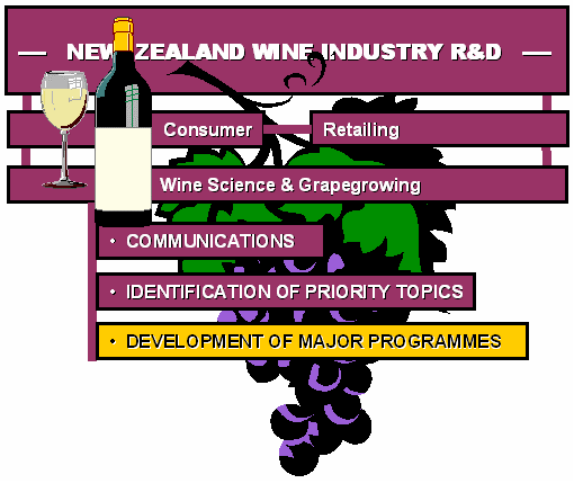
5. *To ensure the efficient use of resources with responsible environmental management of vineyards and wineries*.
   - Optimising the productive efficiency of vines
   - Spread of seasonal practices to ensure efficiency of labour inputs
   - Mechanisation of vineyard and winery practices
   - Efficient use of water and land resources

6. *To ensure New Zealand vineyards are established and maintained with the highest possible vine health status*.
   - Quantify the impacts of vine health on the quality and economics of wine production
   - Improve the economic lifespan of vines
   - Minimising transmission of virus
   - Plant resistance to virus and trunk diseases
   - Prevention and management of trunk diseases
   - Understanding soil and plant interactions

7. *To assist industry in preparedness and response to significant environmental and biological events*.
   - Providing technical knowledge to be prepared for and manage incursions of unwanted organisms

- To provide a knowledge base to respond to adverse environmental impacts such as frost, including prediction, mitigation and management of impacts

Objective Three: Development Of Major Programmes



Recognising the success of the FRST-funded *Sauvignon Blanc* programme in building capability and capacity within the industry, and to make more effective use of the industry's own funding, a vital part of the sectors R&D Strategy is to maintain this momentum by fostering successive and complementary major programmes.

A base objective is therefore to develop programmes that bring together a range of the topics cited in Objective Two.

FOCUS: To Develop major programmes that:

- match the strategy of NZ Winegrowers
- will produce useful outcomes for the wine industry
- fulfil the funding criteria of third party funding agents

CONSIDERATIONS

The continuance of Major Programmes is critical to the industry Vision and all aspects of the R&D strategy.

The existing *Sauvignon Blanc* programme includes, deliberately in one programme, contribution to a large portion of the strategic topics cited in this R&D Strategy (Objective Two above). It is recognised that not all major programmes will attain such a high level of integration.

The WRC will seek to develop a model with all major programmes where the governance of the programme is shared between the industry and contributing research providers. It is anticipated that this will reflect the "ownership" within the programme, and will assist in ensuring that all stakeholder interests are well represented.

STRATEGY

The strategy is to

- Clarify industry requirements
- Share the priority topics (in Objective 2) with Science Providers
- Seek Science Provider input to the Major Programmes list
- Consult Science Funding agencies for funding options, e.g.
    - FRST, Marsden, other Government Science Funds
    - Other NZ sources, e.g. major corporates, government and NGO development funding
    - Develop collaborations which may access international funds

- Other sources may be considered long-term such as seeking venture capital or other direct investment

- Work with Providers in developing proposals for major programmes.
- Provide clear information to funding organisations of the “fit” of major research programmes within the industry's wider research (information) needs and strategy
- Integrate major programme investment with supporting industry-funded applied work.

INTERNATIONAL LINKAGES

It is critical to secure ongoing connection with the New Zealand science funding through development and maintenance of a suite of major research programmes to provide research input which will provide specific advantage to the New Zealand Industry.

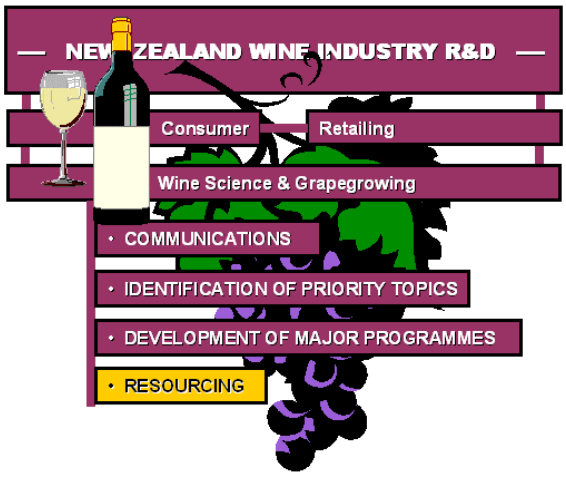
However in some areas of research developing collaborations with international research and industry partners may provide significant advantage to the ongoing industry research programme. It is intended to build dialogue with especially Australian based R&D capability parties. This will provide the opportunity to share costs and risks for R&D in areas of common need, and to speed up the discovery process in key areas.

It is recognised that a significant proportion of the New Zealand industry is linked to internationally owned businesses, and it is not possible (nor always desirable) to seek to “quarantine” information. The benefits of international collaboration outweigh the potential threats, and appropriately managed can assist the industry research programme. Appropriate protection of New Zealand’s intellectual property must always be considered in any international collaboration.

Objective Four: Resourcing

Whilst the adoption of the R&D Strategy aims to reduce workloads on the voluntary time of WRC members, it is apparent that the sole executive of the NZW science work is insufficient capacity to carry out the objectives. As cited in the section on Weaknesses (see Section 3.2 – pg. 5)

> *Present R&D management capacity is close to its limits in terms of commissioning research tasks and managing liaison with research Providers.*



The additional resourcing needs include Communications, guiding Uptake by Industry and Organising support for the NZW Manager Science and Innovations.

It is important to recognise that as the scale of R&D investment increases, the capacity of voluntary inputs will be exceeded. Recognising this, additional resources will need to be funded and added. The WRC note that managing programmes can be as important as getting the funding for those programmes and providing appropriate professional support must be a priority.

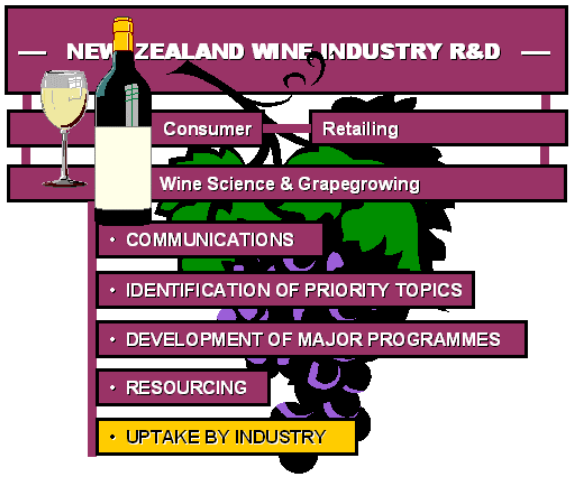
The strategy to address this important resource limitation is for

(a) The WRC to discuss with the NZW Board and executive as to how additional capacity to support the Science and Innovations Manager can be resourced e.g. as dedicated persons, as a shared resource, or outsourced.

(b) Also to be considered is for at least some aspects of programme management to be incorporated into the funding bid for the programme.

Appropriate resourcing will ensure that the industry is able to provide responsive and timely support to the rapidly growing and diverse needs of the research programme.

Objective Five: Uptake by Industry



The often expressed view by industry is that a research project is not complete until the knowledge has been put into practice by industry. While this is clearly not the case with all research it should be the guiding principle for the majority of industry funded programmes.

Uptake of research findings may require several often quite specialised processes and will not always be delivered by either the researchers or NZW. The role of WRC as the industry body managing the research programme is to guide and where possible facilitate the development of the appropriate processes to ensure uptake of research findings, and to ensure all stakeholders in the various processes have access to the best information available.

KEY STEPS IN UPTAKE BY INDUSTRY

Information Dissemination - this is primarily about letting people know the findings of research programmes and includes:

- publication of results in journals and industry publications
- publication to web-based systems
- presentations at conferences seminars and workshops
- use of public media (more a part of the communication objective)

Application Development - research findings often require further work to develop meaningful applied processes to take advantage of new knowledge, application of findings is not always intuitive.

Education – closely aligned to information dissemination, tends to be more information based, includes development of education for new entrants and existing industry participants. It is important that this be based on best current knowledge.

Training – more aligned to application development, aimed specifically at industry participants providing understanding on how to apply new tools and processes.

Support - Various service providers provide support to the industry it is important that these providers are aware of the most current information and applications available to the industry.

The WRC has a major direct role in the Information Dissemination and Application Development processes, and will need to plan to resource these activities appropriately either directly or through the partnerships with research providers. Appropriate systems and relationships to ensure Education, Training and Support are addressed need to be developed; the WRC role in these functions is more indirect facilitation or advisory.