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EDITED VERSION

Survey of Small & Medium Wineries – Technology and Information Needs, 2004

A report from survey research conducted in October 2004 with commercial wineries across Australia, to assess current quality parameters and testing processes, and general information usage and attitudes.

Prepared for:

Cooperative Research Centre for Viticulture

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1. Executive Summary

This report summarises the findings from survey research among small to medium sized commercial wineries across Australia. Respondents were the people most responsible for the quality of grapes being used for winemaking.

The survey was conduced in October 2004, and sought to understand quality parameters, testing, satisfaction with testing procedures, views of CRCV activities, interest in various management and testing systems, and information usage and sources.

The following is a summary of the main findings from the project:

A. *Many attributes of quality are tested, but sometimes by non-scientific means*

- When asked for top of mind perceptions of important quality attributes, the most frequently mentioned were brix/baume, acidity and pH, taste, colour, flavour compounds, and vine and grape health
- The factors most often tested for were brix/baume (84%), acidity (68%), pH (66%), taste (33%) and flavour (18%)
- There was interest in testing for colour/anthocyanins (19%) and flavonoids (7%), in addition to existing tests
- The methods used to test grapes were often using equipment like pH meters, refractometers, hydrometers, etc, but often, technical parameters like acidity, brix, pH etc, were tested via sensory means, thus some tests are rules of thumb at best
- Satisfaction with existing tests was found to be reasonable, and dissatisfaction was more evident in relation to colour/anthocyanins (11%), taste (9%) and vine or grape health (7%)

B. *There were several barriers to testing, particularly among small producers*

- Throughout the report, variations based on size of the vineyard are outlined, and overall, the smaller producers test less often, rely more on personal experience and judgement, and tended to perceive technology as being more suitable for larger producers

- Smaller producers also tended to perceive new technologies are difficult to learn and to use, and often raised many barriers to change – small size, no time, cost, happy with existing methods, etc
- Some commented that there are no effective tests for many quality attributes, which partly explains the interest in near infrared.

C. *Computer usage is very high and increasing, and electronic communication is now a rational option*

- Most (91%) have a computer
- Virtually all of these computer owners have an Internet connection
- A range of activities is now being handled by computer – emails, wine and vine sites, buying and selling
- Of those without a computer or Internet, around half expected to get one soon
- MYOB (40%) and to a lesser extent Quicken (15%) were the most popular accounting packages
- Most (65%) analyse costs as a whole, with the others being divided between varietal accounting or block by block analysis
- Despite the above, most tasks like spray diaries, pest activity, chemical data etc, is manually recorded, though 71% computerise financial data. The move to computers is incomplete in that regard
- There is now strong acceptance of emails as communication media for critical information. More suggested email (40%) than any other method.

D. *Interest in NIR is strong, moderate for PAM Ausvit and VineLogic*

- Yields are generally estimated by bunch counts (72%), or visually (15%), with 20% not being satisfied with the accuracy or reliability of such tests
- Interest in PAM Ausvit was moderate – 26% were interested at $1,695, and 20% were interested only in the QA essentials module at $230 (note that since the survey was conducted, some parts of this package have been made available for free at www.fairport.com.au)
- 16% were definitely interested in VineLogic, cost estimates averaging $1200, though they were higher for larger producers
- Near infrared (NIR) was well received, with 46% being definitely interested. However, demand at $15,000 was 6% (based on those definitely being interested at that price)

- In all cases, smaller producers raised a series of barriers as raised in point B above
- Awareness of and interest in Viticare activities was moderate to high, especially among larger producers, particularly Research to Practice Workshops (54% awareness). Also note that 27% had been involved in regional CRCV activities.

E. *Attitudes to information were generally positive, though emphasis is on regional data*

- Most producers are pleased with both the quality and quantity of information they receive, and most felt that they got the right type in the right way
- Some of the concerns raised were inconsistent or contradictory information from different sources, as well as suffering overload at times. Note that to 28%, things are not yet bad enough to read everything, positioning information for them as a "grudge" activity, not an opportunity
- Over half (54%) agreed that information needs to be regionally specific, and 40% wanted more emphasis on the implementation of information.

F. *Local associations and other local contacts are critical to learning*

- Industry association newsletters (66%), as well as other local association sources (21%) were central to producers
- Other producers (32%) were also important sources, as were consultants to a lesser degree, emphasising the usage of local sources
- The Internet (22%) was also popular, though other sources of data were used less frequently.

G. *Wine producers are big consumers of publications and conferences*

- Overall, readership of winemaking and viticultural magazines was high, being from 53% to 80% for the main national publications
- Readership consistently increased with vineyard size
- Attitudes to most publications were very popular, particularly Grapegrower Winemaker and Australian Viticulture
- Few overseas magazines and publications were read, Decanter being the most popular (5%)

- 75% had attended a conference in the last 2 years, and the AWI Technical Conference (33%) and local association conferences (28%) were the most popular.
- Most conferences were regarded as being useful, largely for new ideas, new information and making contacts
- Conference topics seen as most useful were (in order) winemaking quality and management, vineyard management, grape quality, new R&D, pest and disease management.

2. Conclusions and Recommendations

2.1. Quality Testing and Interest in CRCV Technology

Overall, there is broad recognition for the need for quality, the need for testing, and its actual conduct. However, many producers, particularly smaller producers, are either not testing for various quality attributes or else are using inappropriate or inaccurate methods.

There is demand for better testing, but also barriers to them, often by the smaller producers. New testing processes are seen as suitable more for big producers, whilst experience and judgement are often relied on rather than equipment.

The survey found strong interest in NIR, though moderate interest in PAM Ausvit and VineLogic.

We make the following comments:

A. Near infrared

The high level of interest in NIR suggests that its potential benefits are recognised. A price of $15,000 would be a barrier for many. It does offer the ability to test for attributes that producers are currently not testing for but would like to test for eg colour.

The larger operations should be targets at the outset, particularly in NSW. Note however that the end product would need to be considerably better than existing testing methods to attract buyers at $15,000. At present, demand is insipient, not potential.

B. PAM Ausvit and VineLogic

These technologies were of interest to some producers, and there appear to be commercial opportunities for them at suggested or expected prices.

Demand is moderate though reasonable among larger producers. The advantages would need to be developed into clear value propositions for the market. Again target larger operations.

In relation to small businesses, various barriers need to be broken down prior to adoption of these technologies, or else create packages, which are purpose built for smaller producers.

2.2 Viticare and the CRCV

The results were quite positive for Viticare, though awareness of and involvement in Viticare and CRCV activities was limited among smaller producers.

Our suggestion is that smaller need to be separately targeted, and possibly workshops or other activities can be tailored specifically to their needs.

Sustainable vineyard practices were not met with a lot of appeal, and the benefits would need to be communicated in the first instance. Producers need education, not just selling of the benefits.

2.3 Information Sources and Issues

Overall attitudes were positive. These producers had an appetite for information, value it, and respond to it quite well, particularly when the findings from this survey are compared to those from other surveys (such as the Grower Survey in 2003, and in various other horticultural industries).

There is however a lot of data they are inundated with, of which some is contradictory and non-local data is treated with some suspicion.

It is also worth noting that whilst there is demand for written and electronic data, many producers are hands-on learners and fast adoption is unlikely without seminars and field days. Conferences in particular were very popular, and they learn from each other as well as the presenters.

The high level of usage of computers and Internet, and the demand for e-mail based information suggests that faster and cheaper information dissemination is possible via electronic means.

We suggest that over time, paper can be cut back. Give them an option to retain hard copy as a default, but seek to migrate them to electronic media.

In the short term, some may complain, but giving them a choice can ameliorate that. Such a strategy has been adopted in other horticultural industries, which have a lower incidence of computer usage and acceptance.

3. Introduction and Objectives

3.1 Introduction

Mark Dignam & Associates Pty Ltd was commissioned in August 2004 by the CRV to undertake a survey of small to medium sized commercial wineries in regard to existing quality parameters and testing, attitudes to such testing, views of existing and proposed technologies, and information usage and attitudes within the industry.

The CRCV is a joint venture between the Australian viticultural industry and leading research and education organisations. It promotes co-operative research to accelerate viticultural management from vine to consumer. Research is conducted by the CRCV in gene technology, vineyard management systems and grape quality.

At the time of writing, the CRCV was looking to commericalise existing technologies for quality and yield management, and develop new testing technologies for grape quality. The survey was undertaken to assist in determining demand for these technologies as well as existing quality parameters tested for and needs for better testing. In addition, the survey was an opportunity to assess the information sources of wineries, and their involvement in CRCV activities.

3.2 Objectives

The project addressed the following issues:

A. Quality Attributes and Testing

- Attributes associated with quality
- Methods used to test for quality attributes
- Satisfaction with such testing
- What attributes of quality are not tested for and why
- Who does testing and how often
- Satisfaction with the reliability and consistency of existing testing processes
- Faults and other attributes they would like to test for.

B. Awareness, Interest in and Demand for Technologies

The following were covered in this section:

- Existing computer sand Internet usage and applications
- Awareness of and interest in PAM Ausvit and QA Essentials
- Interest in VineLogic
- Interest in and demand for NIR (near infrared) technology
- Awareness, involvement and interest in CRCV projects and communications.

C. Current Information Usage and Sourcing

- Readership and attitudes to industry publications
- Current and preferred sources for viticultural information
- Attitudes to the value, relevance, ease of usage and practicality of existing information sources.

D. Conferences

- Conference and seminar attendances
- Their value and reasons for such value
- Topics and presentations considered most useful.

4. Research Methodology

4.1 Sampling

The sample frame was generated from the WineTitles Australia data base, which was supplied by the CRCV for the purpose of this survey.

Within each region, we manually deleted the major wine companies, based on known production volumes as listed in WineTitles.

A quota sample based on proportional probability was selected for each region and state. This means that the survey is representative of each region in direct proportion to its population incidence.

The respondent was the person at the winery who was most responsible for grape quality. Note that consultants and contractors were not interviewed. This survey focused on the owners and managers of smaller wineries, and the winemaking and operations staff in the medium to large wineries.

4.2 Field Method

The interviews were undertaken by phone. Processes were as follows:

- The interviews were conducted on a CATI system (computer assisted)
- The questionnaire averaged nearly 30 minutes. Interview time did vary based on how much respondents had to say, though it is worth noting that many respondents did go into some detail
- Interviews were made both during the daytime and the evening. Calls were made initially during the daytime, with call back appointment times being made both during the day and the evening. All calls were made Monday to Friday
- Multiple call backs were made, being whenever the respondent was busy or unavailable when we initially called
- The fieldwork was undertaken from Sydney
- All coding was undertaken by our project manager
- Cross-tabulated data was prepared from the survey, which was separately presented.

Readers should note that all data presented in this report from the industry survey is subject to error. This is random error, which is the due to the fact that a number of samples could be drawn using the same sampling method, with each giving a slightly different result.

The maximum error (standard error of the proportion) based on a sample size of 200 is 6.9%. That assumes a survey result of 50% (for example, 50% agree with a particular statement). As the survey result approaches 0% or 100%, the error is lower, as it is less free to vary. Given that the universe is small, the real standard error is likely to be less than that theoretic limit.

We have provided comparisons between states and size categories whenever relevant. Note that regional variations are possible only at state level due to the sample size, as small sub-group sample sizes limit the achievement of statistically significant results. By “significant”, it means that the variation between one result and another is a true difference between the groups, with at least 95% probability.

4.3 Descriptive Characteristics of the Sample

The size and regional breakdown was as follows:

Table 1 – Vineyard Size by State

State	*NSW %*	*QLD %*	*SA %*	*TAS %*	*VIC %*	*WA %*
1 to 5 hectares	23	50	22	40	31	20
5.1 to 10 ha	25	30	10	50	18	28
10.1 to 50 ha	25	20	32	10	27	32
Over 50 ha	25	0	30	0	18	20
Not stated	2	0	6	0	6	0
(Sample size)	(40)	(20)	(50)	(10)	(55)	(25)

The overall results for the sample were as follows:

- **Up to 5 hectares – 28%**
- **5.1 to 10 ha – 22%**
- **10.1 to 50 ha – 27%**
- **over 50 hectares – 20%.**

In short, half had no more than 10 hectares (15 acres) of vines, with most of the Queensland and Tasmanian wineries being small. Note also that a small number bought in grapes from contract growers.

In relation to grape varieties, we limited the scope of the question to white and red varieties, and we found that on average:

- **36% were white varieties**
- **64% were red varieties**

In terms of the mix of red and white grapes by state, we found the following:

Table 2 – Grape Colour by State

State	*White grapes – average %*	*Red grapes – average %*
New South Wales	43	57
Queensland	37	63
South Australia	30	70
Tasmania	47	53
Victoria	31	69
Western Australia	40	60

There were more red than white varieties in each state though red varieties were more prominent in SA and Victoria.

Many of these producers had been in the industry for over 20 years – this relates to the individual not necessarily the winery. The following table summarises the data:

Table 3 – Years in industry by State

State	*NSW %*	*QLD %*	*SA %*	*TAS %*	*VIC %*	*WA %*
Less than 2 yrs	0	5	4	0	2	0
2 to 5 years	13	20	8	10	5	4
6 to 10 years	28	45	24	20	24	48
11 to 20 years	35	15	30	30	31	32
Over 20 years	25	15	40	40	38	16
(Sample size)	(40)	(20)	(50)	(10)	(55)	(25)

Overall, six in ten had been in the industry for over ten years, and only 2% (four respondents) were new entrants, having less than two years' experience. Those with small holdings (up to 5 ha) were more likely to be new entrants, though there were no variations across the other size groups.

In relation to winemaking duties, we found that 84% had their own label, and of the 168 who make wine, the winemaking was shared as follows:

- 46% make it themselves, the incidence being correlated with size, being 62% for those with up to 5 hectares, and 23% for those with 50 or more hectares. This incidence also increased with the number of years' experience in the industry
- 42% used an external contractor. This was more common among the middle-sized groups, being 51% of those with 5 to 50 hectares
- 11% were done by partners, thus the winemaking and quality related work was sometimes separated. This was uncommon for wineries with over 50 hectares
- In one in ten wineries, a staff member did the wine making, but that was mainly among those wineries which had over 50 hectares (40%), compared to only 3% of those with up to 50 hectares.

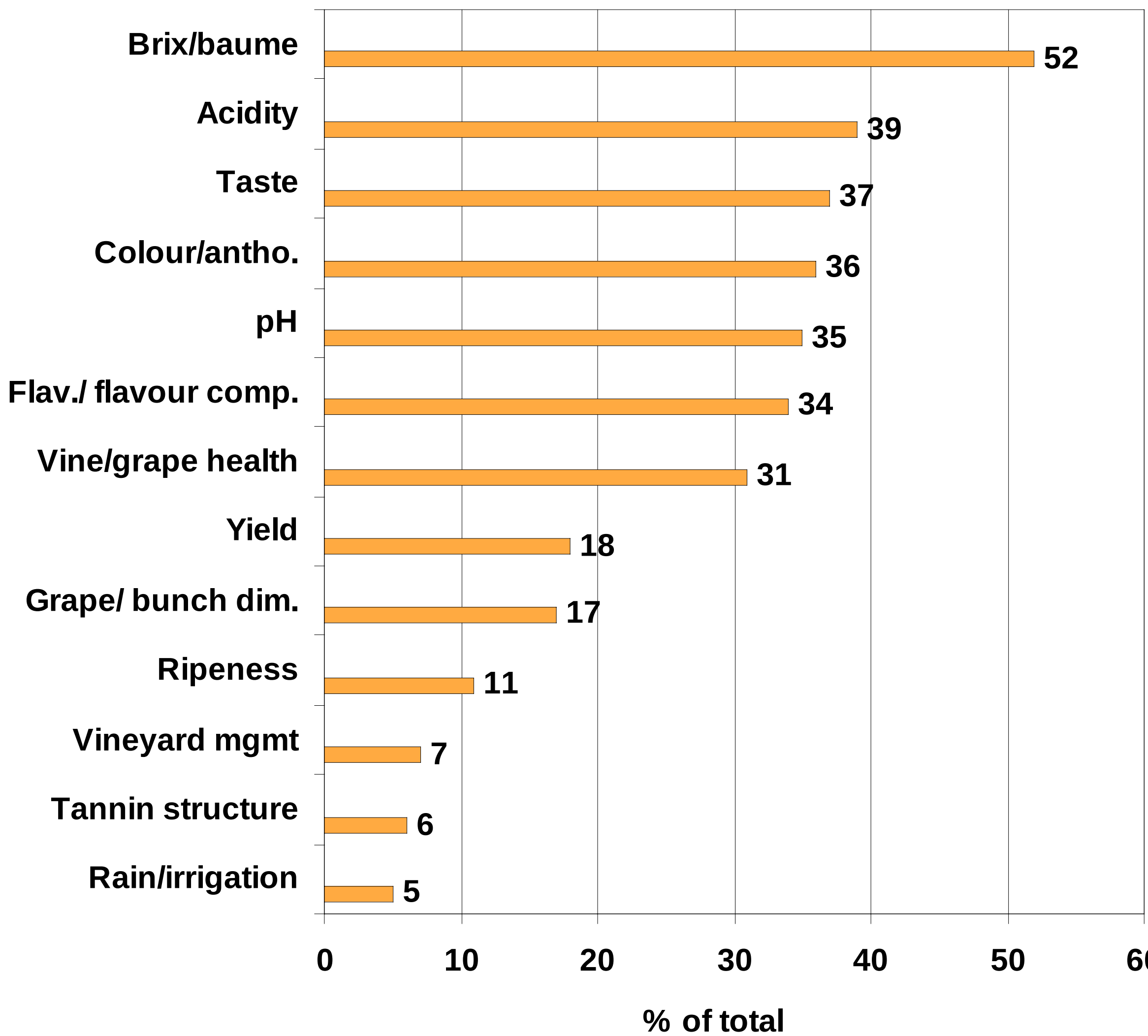
5. *Quality Attributes and Testing*

This section quality of grapes being used in the winery, from a viewpoint of existing testing processes, and what they would like to test for.

5.1 Grape Attributes Associated with Quality

The following were spontaneously mentioned as indicators of grape quality:

Figure 1 - Unprompted quality attributes



This question was unprompted, and tests for top of mind awareness of important attributes, not all attributes.

A hierarchy of attributes is evident, with brix or baume, acidity, taste, grape colour or anthocyanins, pH, flavonoids or flavour compounds, and health being the major attributes.

Several other quality attributes were mentioned at lower incidence, such as appearance, balance or complexity, tannin structure, weather or phenolic maturity.

In relation to the size variations, the following variations were evident:

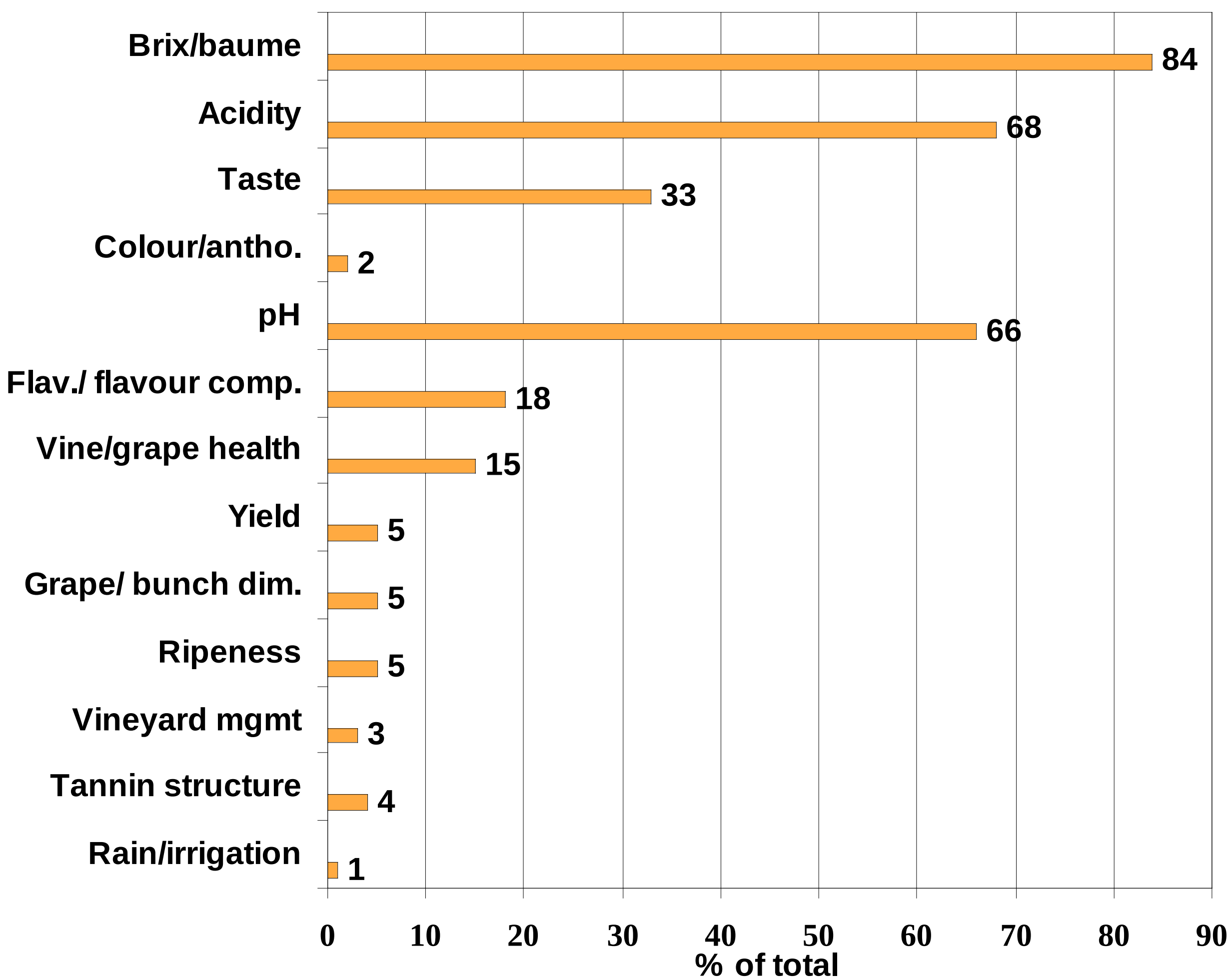
- Smaller winery personnel were more focused on crop level or yield as a quality indicator. Mentions of that attribute fell from 27% (up to 5 ha) to 8% (50+ ha)
- The larger producers generally considered more attributes, particularly taste, grape colour or anthocyanins, flavonoids or flavour compounds.

It is reasonable to say that the larger producers are more scientific rather than artistic in this regard, particularly in regard to colour and flavour compounds. Mentions increased from 21% to 55% for colour, and 23% to 55% for flavour.

5.2 Quality Attributes Tested for

Next, we asked what attributes off quality they actually test for. This is a behavioural rather than attitudinal question, and note that overall, more factors are tested for than were mentioned in the previous figure.

Figure 2 - Quality factors tested for



The actual testing processes used by most producers were for brix//baume, acidity and/or pH. Note that compared to the factors mentioned as important, actual testing is more limited, and colour or anthocyanins were rarely tested for (2%) compared to 36% that said they were important. To a lesser extent, flavour compounds were less often tested, being 18% compared to 34% that said that they were important.

The incidence of actual testing increased consistently with size, though not for flavonoids or flavour compounds, and taste. It did however increase for colour or anthocyanins.

There were also a few state based variations:

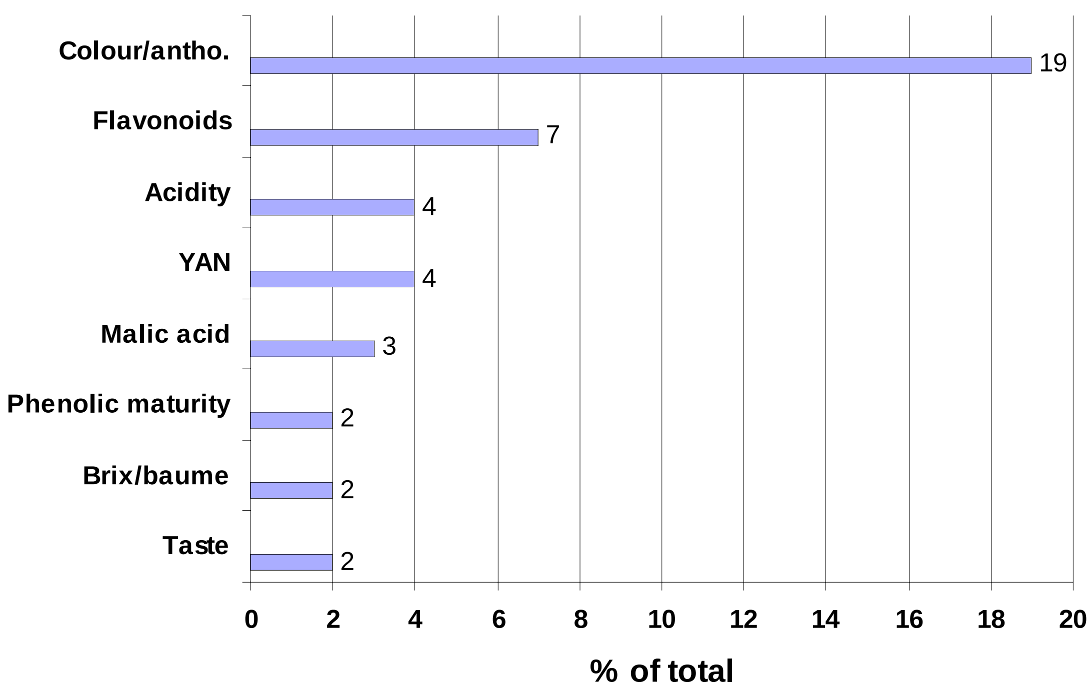
- In NSW, few (5%) tested for flavour compounds, though the incidence of other testing was average
- In SA, less tested for pH, though acidity was average
- In Victoria, flavonoids testing was relatively high at 27%
- IN WA, taste was more often tested (52%), though that variation was not quite statistically significant.

In short, there are variations between what is seen as important, and what is actually tested for. There are gaps particularly in relation to flavour and colour compounds.

5.3 Quality Attributes Producers Would Like to Test For

We then asked what quality attributes they would like to test for. The following figure depicts those mentioned by more than 1%:

Figure 3 - Quality attributes producers want to test for



As noted earlier, grape colour or anthocyanins, and to a lesser extent flavour compounds, were high priorities for new testing. A number of other aspects were also mentioned by 1% or less, such as crop level, skin thickness, bunch dimensions, balance, complexity, etc.

For both colour and flavour compounds, more demand was evident among the larger wineries, particularly in the case of flavour. It was also evident that more experienced producers were the main targets and NSW producers most wanted these tests (30% for colour, 13% for flavour compounds).

5.4 Who Does the testing and how often?

Generally, testing is done by the respondent – who in most cases was the owner or manager of the property, staff or other workers, or contractors. Only a small minority are sent away. The following table summarises who does the testing:

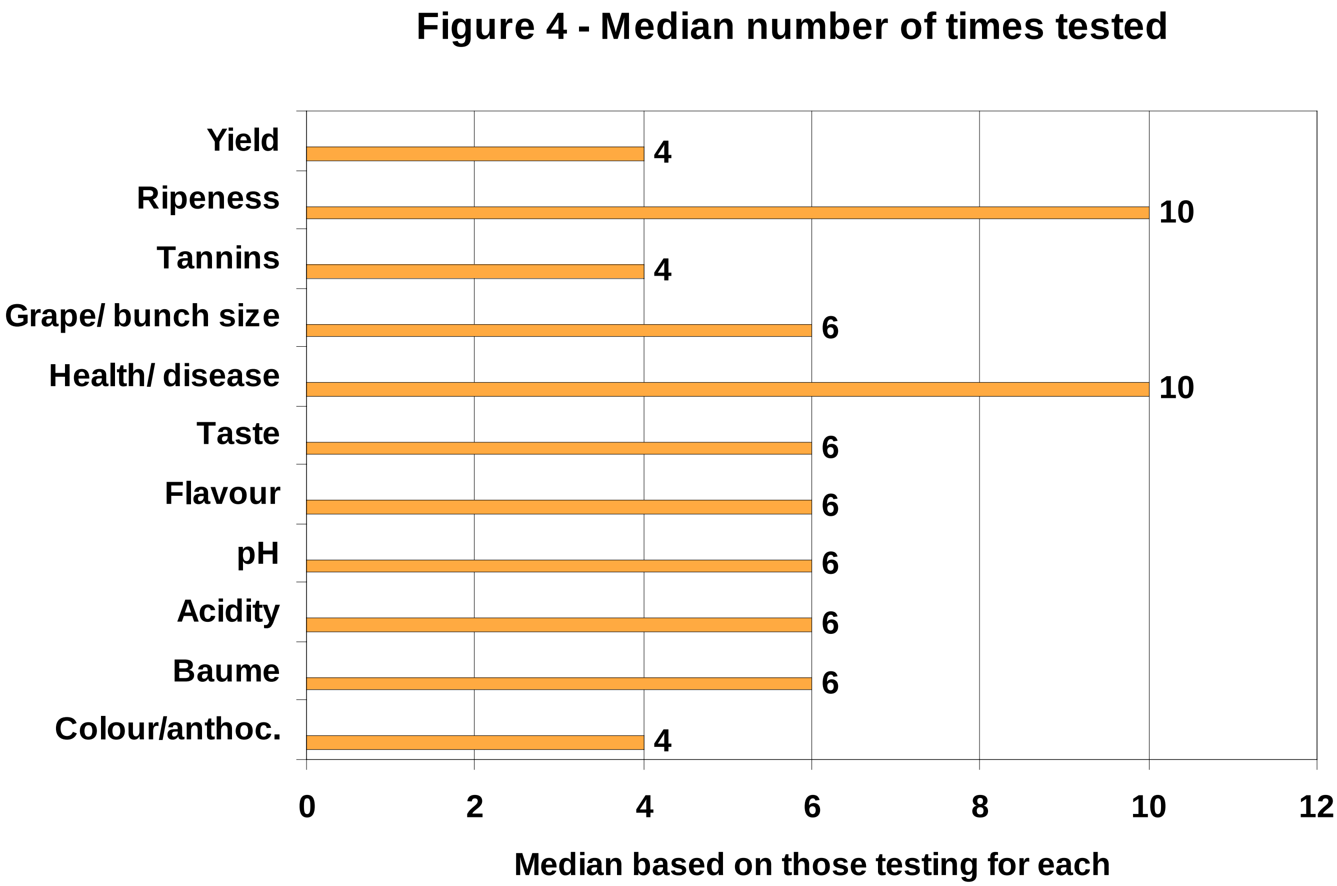
Table 4 - Who conducts each test?

Test	*Self %*	*Staff/other workers %*	*Contractor %*	*Sent away %*
Colour/anthocyanins	54	19	21	5
Brix/baume	63	22	11	5
Acidity	59	20	16	6
pH	59	17	15	8
Flavour compounds	62	18	8	13
Taste	61	25	10	3
Grape/vine health	62	24	10	3
Size/shape dimensions	80	20	0	0
Ripeness	89	11	0	0
Yield	56	11	22	11
Tannins	57	14	29	0

In all cases, the respondent to the survey was the most common, and only a handful sent any samples for testing.

Based on size categories, a consistent pattern was evident. In smaller wineries, the respondent was most often involved in all tests, and sometimes contractors were used. In the larger properties, staff were often relied on, whilst the usage of contractors was not affected by size of the property.

In terms of the **frequency of testing**, we found the average number to be as follows:



The actual incidence did vary substantially. The above data is a median, which is a more relevant predictor of the incidence that the mean (average), the mean being higher than the median as that mean was affected by a small number of producers who make very frequent checks.

Overall, health and disease are checked ten times per season, as was the case for ripeness. Yield and tannins (if tested) were checked four times a year, and all other attributes were tested six times a season. The actual time during the growing season that various tests are conducted will of course vary.

Larger producers tested more often for parameters such as acidity, pH, baume etc, but the smaller producers tested more frequently for taste.

5.5 Methods Used to Test for Quality Attributes

The main testing methods for each quality attribute are depicted below. Note that the table has been limited to the most common testing processes.

Table 5 - Popular testing methods

Test	*Taste %*	*PH meter %*	*Send to lab %*	*Spectral analysis %*	*Visual %*	*Refract ometer %*	*Hydro Meter %*	*Titration %*
Colour/anthocyanins	21	14	14	9	9	7	7	4
Brix/baume	9	15	6	6	4	32	31	9
Acidity	7	33	11	0	0	9	8	28
pH	14	45	10	0	4	8	8	14
Flavour compounds	51	5	3	5	13	13	18	3
Taste	51	9	5	0	7	10	16	0
Grape/vine health	24	3	7	0	69	0	0	0
Size/shape dimensions	0	0	0	0	30	30	10	0
Ripeness	33	22	0	0	11	11	0	11
Yield	22	0	11	0	11	0	0	0
Tannins	43	0	29	0	14	14	0	0

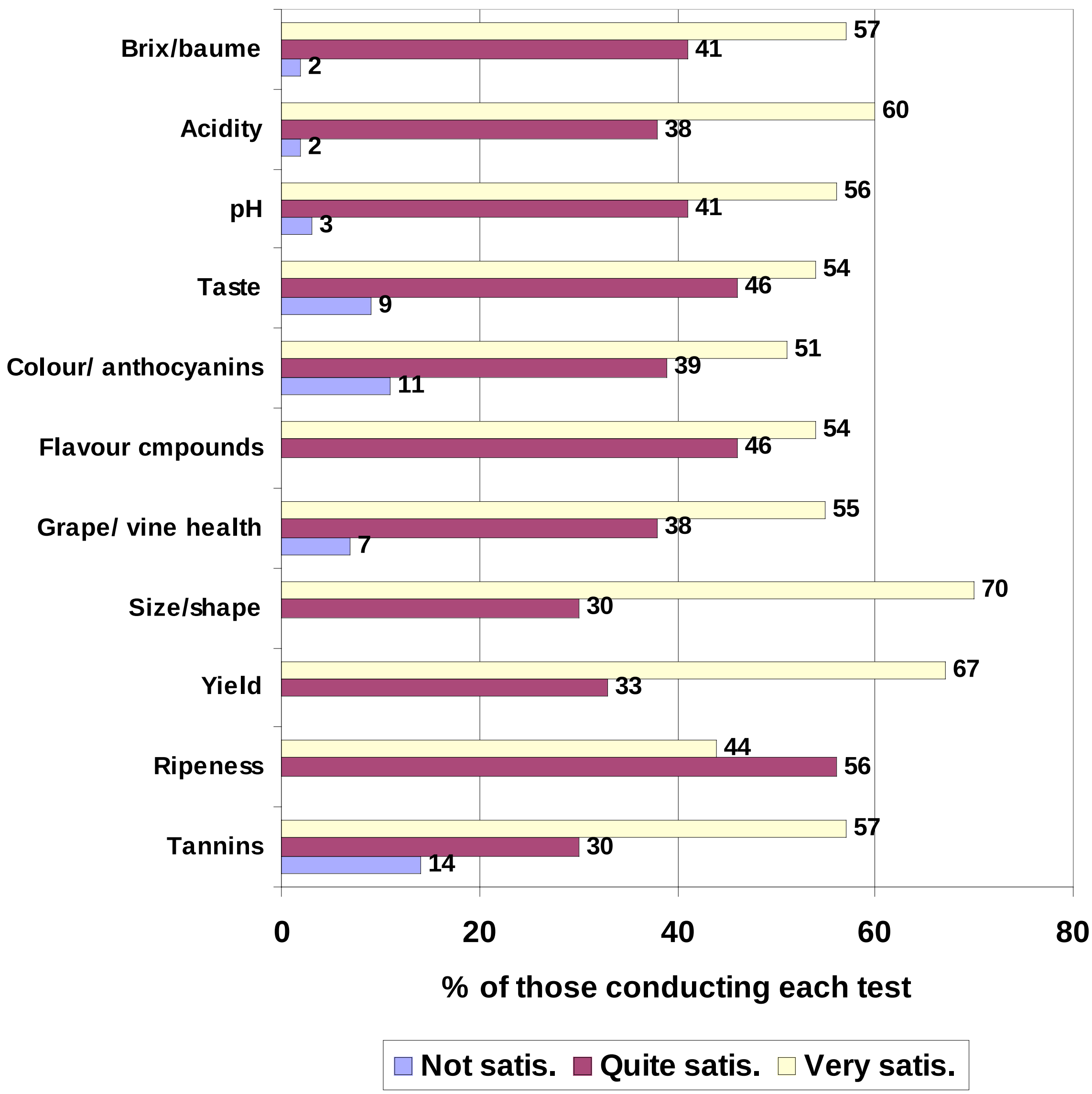
A number of other tests were used at low incidence for specific tests, though all at low incidence. Also note that the above data may add to over 100% as any one producer can use more than one method.

Whilst a variety of testing methods is understandable, it is evident that many of these methods are not entirely suitable for every test, and in some cases, are rather illogical. A few examples:

- Visual testing or taste testing was popular for many attributes, such as pH, ripeness, baume, etc. Whilst understandable, these are not specific measures; they are rules of thumb based on experience
- Some technical tests are on the other hand proxy measures of attributes such as taste. In this case, some testing equipment used (refractometers, hydrometers) will not give a “taste” reading; the measures are used again as a rule of thumb.

Next, we asked respondents how satisfied they are (irrespective of the testing method they use) with the accuracy and reliability of that method. We found the following:

Figure 5 - Satisfaction with existing testing method



Overall, most are at least quite satisfied, noting that this is based on those actually conducting tests for these attributes. The number testing for each attribute is in descending order in figure 5; with 171 testing for baume/brix, only 7 for tannins.

In relation to dissatisfaction, it was more apparent with taste, and colour/ anthocyanins, and to a lesser degree, vine health. Tannins was a low incidence test, thus the data is not reliable.

The above also suggests that many are “quite” satisfied, thus there may be room for a better testing process, which is addressed in the next section.

5.6 Reasons for Not Testing for Quality Attributes

The following were mentioned as reasons for NOT testing for any quality attribute:

Table 6 - Why attributes are not tested for

Test	*No method %*	*Cost %*	*No equip't %*	*Not import. %*	*Too complex %*	*Time %*	*Just learning %*	*Unrel-iable %*
Colour/anthocyanins	45	18	11	8	5	5	5	3
Brix/baume	20	0	0	20	0	20	0	0
Acidity	30	0	30	0	10	20	0	0
pH	33	0	0	0	33	0	33	0
Flavour compounds	35	24	6	0	6	6	0	18
Taste	0	25	0	25	25	0	0	25
Tannins	43	0	0	14	43	0	0	0

Overall, the main barriers were:

- Not having a suitable or reliable method to do it
- Cost
- No equipment, experience or time
- Lack of skills or the perception it is too hard
- The perception it is not important.

The above barriers tended to be generalised, rather than being specific to any type of testing.

6. Computer Usage and Applications

This section of the report covers computer usage and applications. Note that the next section on vineyard and testing technologies require computerisation.

6.1 Computer Usage

Of the total sample, 91% used a computer, which increased from 86% among those with up to 5 ha, to 98% among those with over 50 ha. Similarly, incidence increased with years in the industry.

Of the 18 respondents who did **not** have a computer, we found that eight (8) intended to get one in the next year or so. Those not interested again remained the smaller producers.

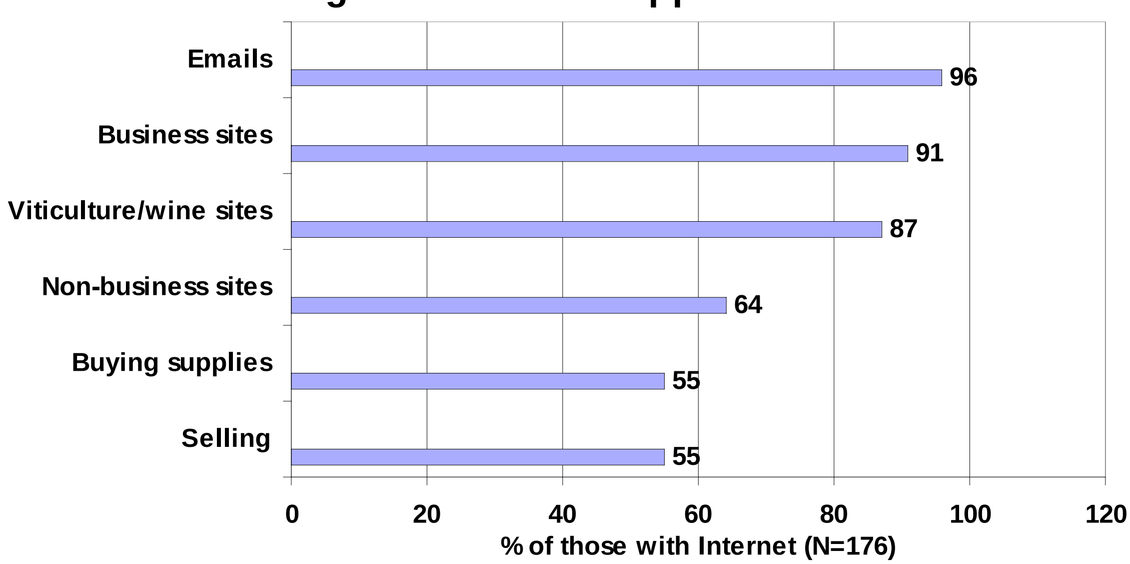
In summary, incidence should be 95% in a year or so based on the above data, and whilst a few may hold out, almost complete usage of computers should be expected soon.

Existing users nearly always had an Internet connection, viz:

- 97% had such a connection, which is 88% of the total sample
- Most of those without an Internet connection intend to get one in the next year or so, thus usage should reach about 93% of the total in a year or so.

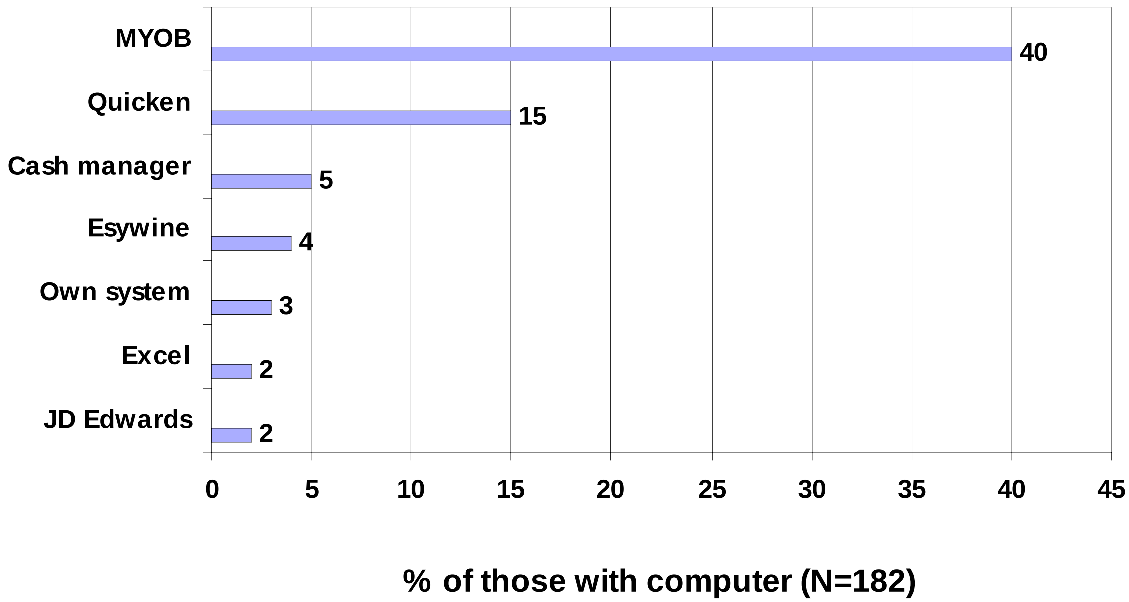
The following were main applications of the Internet:

Figure 6 - Internet applications



We then asked computer users what computerised package they use for **accounting**, and found the following:

Figure 7 - Computerised accounting packages



In short, MYOB was by far the most popular, and note that it was the most popular among all size groups. However, it was relatively less popular (26%) among the larger producers. Rather, other systems like Ezywine (13%) and JD Edwards (10%) were used by these producers, though rarely by small producers.

Quicken was used mainly by small producers, being one quarter of those with up to 10 hectares, 14% of those with 11to 50 hectares, and 3% of those with over 50 ha.

We also asked if they analyse costs and income for the **vineyard as a whole**, or by **grape variety or block**. We found that:

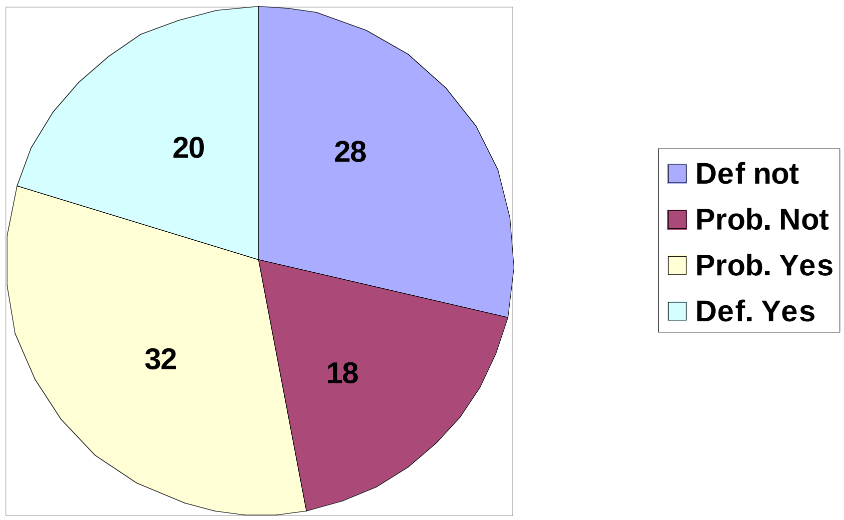
- 65% analyse costs based on the whole vineyard. Of those with up to 5 hectares, 85% did so, with the incidence falling to 55% among those with 50 or more hectares
- 21% analysed costs by grape variety, the incidence increasing with size, from 13% for the smaller producers, and 29% of those with 50 or more hectares
- 21% also analysed by block, and the incidence was more strongly correlated with size, from 2% (up to 5 ha) to 52% (over 50 ha).

The above adds to slightly above 100% as some gave more than one answer.

6.2 Interest in a Block System

Next, we asked if they would be interested in a computer system that interfaces with all cost inputs into the vineyard, on a block by block basis. We found the following based on overall data:

Figure 8 - Interest in Block Based System



Overall, views were rather mixed with one in five saying it would definitely be of use, though at a segment level, the data is more promising, viz:

- Of those with over 50 ha, interest was high, with 38% being definitely interested, and another 33% saying it would probably be of use
- Only 8% of the smaller producers (up to 5 ha) thought it would definitely be of use
- Interest was stronger in NSW (37% definitely of use) and significantly lower in Victoria (8%).

6.3 How Tasks are Handled

We then asked if they did a series of tasks:

- Manually
- By computer
- Not at all.

These tasks covered a number of aspects of vineyard management and quality issues. The data is depicted below:

Table 8 – Current test methods

Test/Process	Manual %	Computer-ised %	Not at all %
Planning annual spray programs	58	29	13
Keep a spray diary	71	22	7
Pest activity	60	19	22
Disease activity	64	19	18
Recording of the cost of pest and disease sprays	34	47	21
Grapevine nutrient concentrations and nutritional performance	57	18	25
Chemical data such as MRLs, residues, withholding periods, or registration information	59	23	20
Yield prediction and historical yield data	51	36	13
Irrigation requirements and water usage	46	26	28
Financial data, such as costs and income	23	71	6
Fruit quality data	53	31	16
Separate profiles of each vineyard block	40	25	36

Overall, only one process – financial data including recording spray costs – was more likely to be handled by computer than manually. Given the usage of computers, the implication is that many have not moved to computer based record keeping, despite having the technology.

In relation to size variations, in all cases:

- The smaller producers were much more likely than the larger producers to not conduct these processes at all, with the exception of keeping records of financial data
- Some were not keeping essential data like spray diaries, and a possible explanation is that in some cases, a contractor or another person may keep it
- The incidence of manual recording fell as size increased, and that was common across the activities above. In the case of financial data, 38% of the smaller producers kept manual records, compared to 3% of those with over 50 hectares.

For each activity that was handled by computer, we asked respondents what program or system they used. This data is summarised in the table below:

Table 9 - Common programs and system used for each activity

Test/Process	Excel %	Word proc. %	Ausvit %	Arkive %	Acces %	Own syst. %
Planning annual spray programs	61	14	12	5	4	2
Keep a spray diary	58	16	7	7	4	11
Pest activity	62	11	8	5	5	3
Disease activity	45	11	11	5	5	3
Recording of the cost of pest and disease sprays	39	10	4	3	2	2
Grapevine nutrient concentrations and nutritional performance	69	3	6	6	6	3
Chemical data such as MRLs, residues, withholding periods, or registration information	29	18	7	0	0	4
Yield prediction and historical yield data	77	7	1	1	3	7
Irrigation requirements and water usage	58	10	4	2	0	4
Financial data, such as costs and income	30	8	1	1	0	1
Fruit quality data	60	11	2	3	2	10
Separate profiles of each vineyard block	63	14	8	4	4	8

Note: The above is based on those using a computer for each test or process.

Overall, Excel was by far the most commonly used system, and for nearly all processes.

Also note that MYOB and also Quicken (as previously summarised) were commonly used for financial data including costs and income, and in the case of chemical data, 31% mentioned the AWRI web site.

A number of other systems (Auswine, Esywine, Cash Manager, JD Edwards, etc) were also mentioned at low incidence.

7. Current and New Technical Systems

This section focuses on existing and proposed technologies including PAM Ausvit, VineLogic and NIR (near infrared).

7.1 Current Yield Measurement Processes

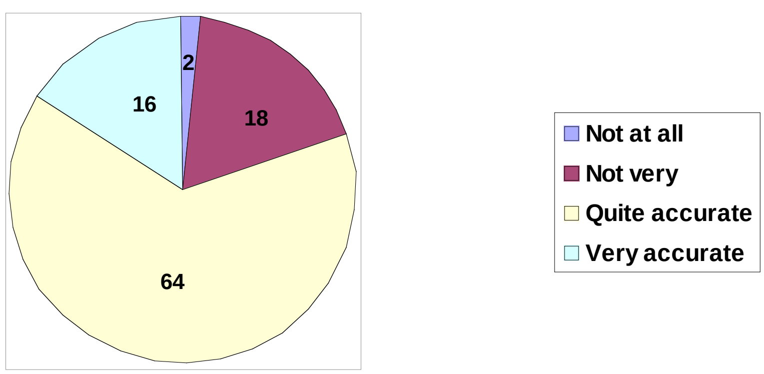
At the time of writing, most producers (72%) take bunch counts in the vineyard to estimate yield. Reading the actual comments made, this is based on sampling through the vineyard, and seems to be comparative across seasons.

A further 15% use a visual estimate, which is simply a rudimentary inspection of the apparent fruit yield on the vines. However, 6% did use a yield estimate kit, with the CRCV sometimes being named as the source.

Only a small proportion did not make any attempt to estimate yield, and most of these were small producers.

When asked how accurate and reliable that method of investigation is, satisfaction was reasonable rather than high, and 20% said it was not very or not at all accurate and reliable, viz:

Figure 9 - View of yield estimation accuracy and reliability



Overall, satisfaction is reasonable, but clearly room for improvement is evident, with only 16% seeing it as “very” accurate.

7.2 PAM Ausvit

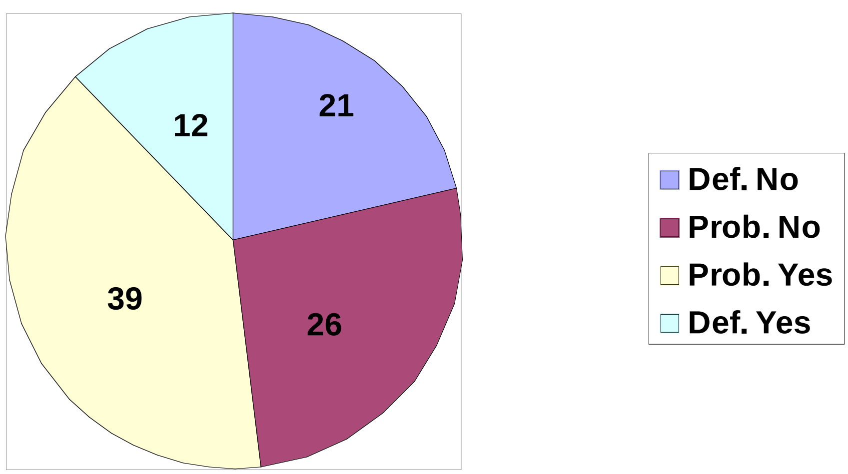
PAM Ausvit is a computerised vineyard management and decision support system. It allows growers to enhance management procedures, monitor vines and help review overall performance from season to season. This involves activities such as the recording, analysis and reporting of critical activities, events and conditions within the vineyard, as well as vineyard input costs, activities and production.

Awareness of PAM Ausvit was 31%, with this awareness level increasing from 11% among the smaller producers (up to 5 hectares) to 54% among those with over 50 hectares. We asked:

- Their interest in PAM Ausvit, with no reference to price
- Interest in the whole package at $1,695
- Interest in a QA essentials sub-package, at $230. (Note that since the survey was conducted, some parts of this package have been made available for free as the QA LINK spray diary).

In relation to interest (not demand), responses were as follows:

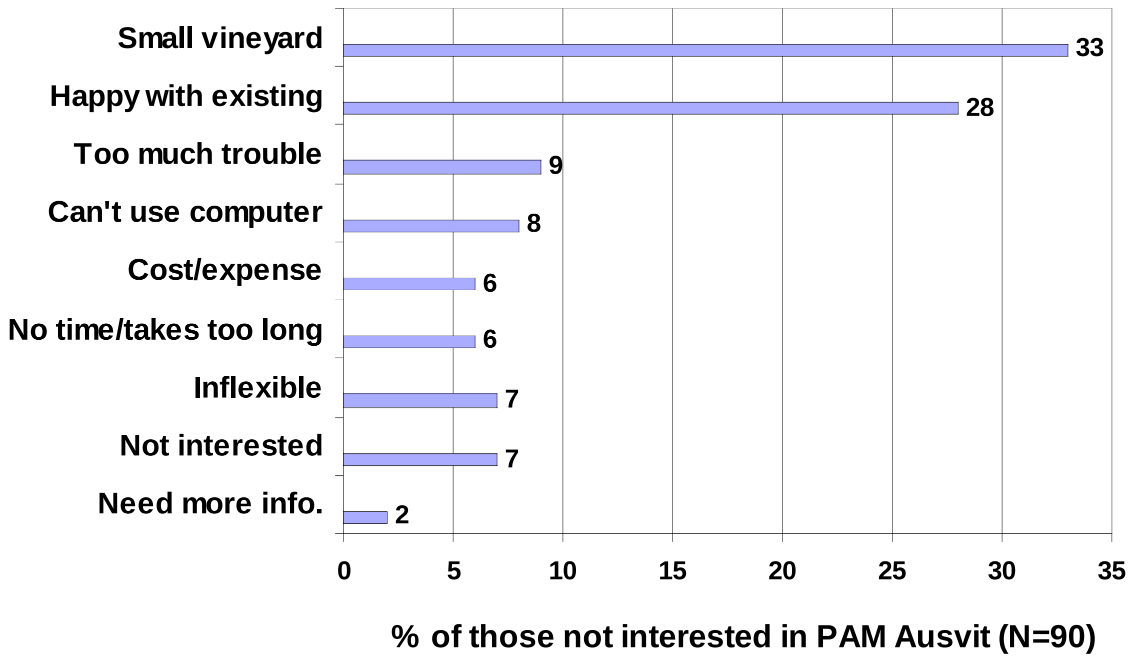
Figure 10 - Level of interest in PAM Ausvit



Overall, interest is best described as moderate. It was higher among larger producers, but even among those with over 50 ha, only 19% were definitely interested, though 51% were "probably" interested.

There were many barriers raised by those not or probably not interested, viz:

Figure 11 - Barriers to interest in PAM Ausvit



The above demonstrates that size is a barrier, with many seeing PAM Ausvit as more suitable for larger properties. Note that half the smaller producers gave that response, though at the same time, half did not see it as a barrier.

Some (28%) felt that their existing testing systems were adequate, though it was also evident that there was a perception that PAM Ausvit would be hard to learn and use. A small number who had already looked at it asserted that it is not flexible enough or otherwise not suitable for their needs.

Whilst limited computer skills are an issue, it would seem that even computer literate producers are sometimes loath to change, underpinning the reliance on existing (and often imperfect) methods, and the perception that change is troublesome.

Interest at the price levels specified was as follows:

- 26% were interested in PAM Ausvit, which is higher than the general interest data (figure 9) would suggest.
- Those interested were more often those with over 50 hectares (41%), though the there was some demand even among those with up to 5 hectares (18%)

❑ A further one in five (20%) were interested in only the QA module, which again was twice as likely among the larger producers.

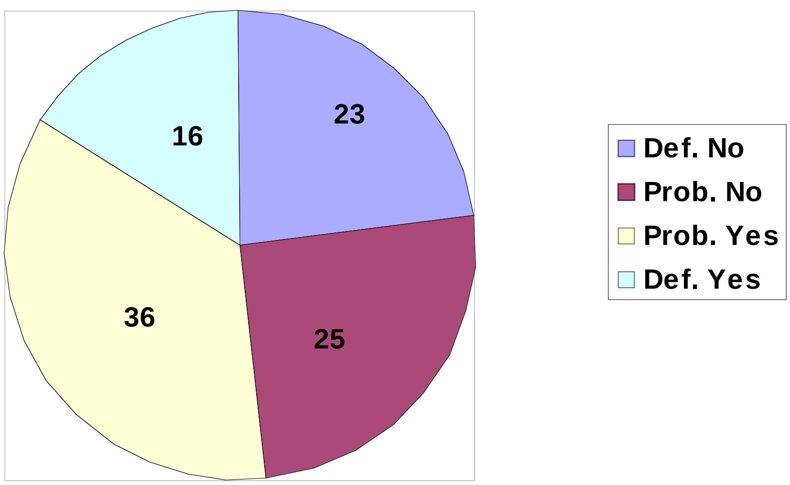
In short, there is demand for PAM Ausvit, particularly among larger producers, though there were also a series of barriers to it, particularly the size of some vineyards and the perception that existing methods are working, and that change is difficult.

7.3 VineLogic

VineLogic is a simulation model of grapevine growth and development, initially developed as an educational tool. The user enters vineyard data like weather, soil characteristics and type, pruning, trellising, water usage, variety and rootstock, etc. There are various on-screen outputs like time of dormancy, veraison, budburst, ripening, yield, stresses and water. The idea is to develop "what if" scenarios to predict vineyard performance like yields, quality, etc.

We asked if this system would be beneficial with no reference to price, viz

Figure 12 - Level of interest in VineLogic



Overall, interest was similar to that for PAM Ausvit, and views were mixed. One in six (16%) gave a "definitely yes" response regarding interest, though note that interest was not closely tied to the number of hectares. Of those with over 50 ha, only 10% gave a "definitely yes" response, though 60% gave a "probably yes" answer.

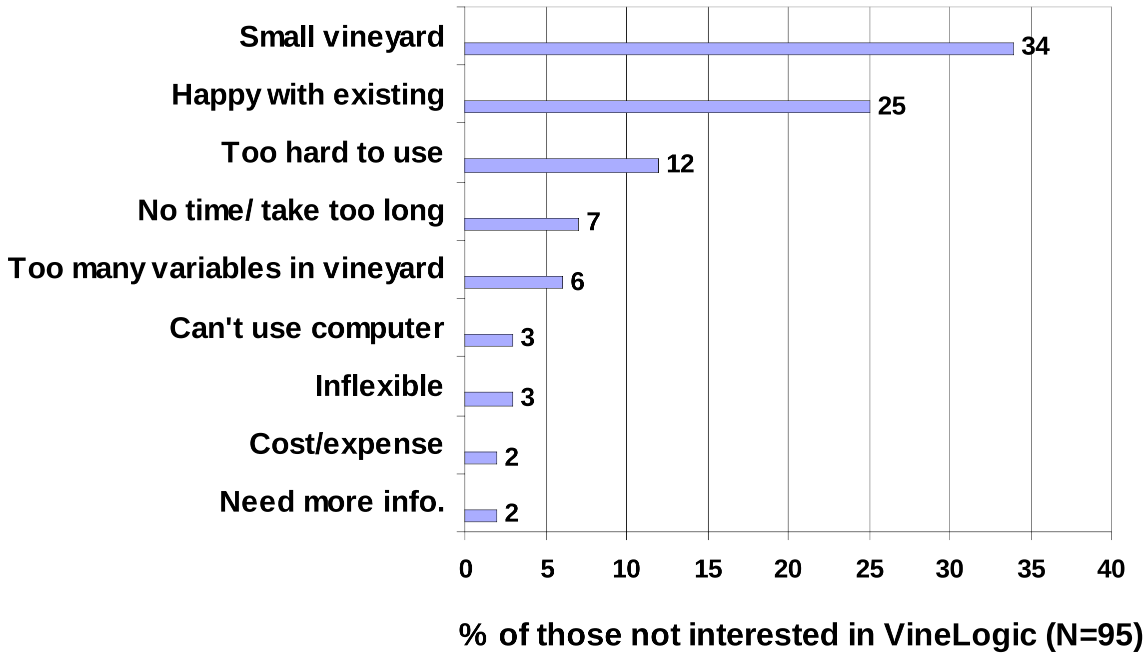
No cost estimate was offered, though we asked all respondents to give an estimate of what they expected VineLogic to cost. Note that they may have used the pricing of PAM Ausvit, earlier, as a yardstick. On that basis, estimates were as follows:

❑ The mean figure was $1,200

- Estimates increased with size from $820 (up to 5 hectares) on average to $1560 on average among those with over 50 hectares.

Barriers to using VineLogic were similar to those associated with PAM Ausvit, earlier:

Figure 13 - Barriers to interest in VineLogic



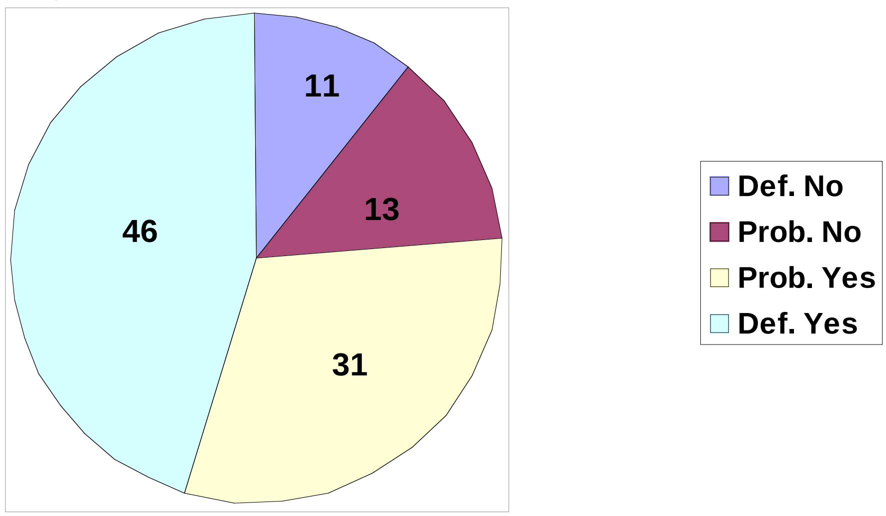
Overall, interest is moderate and comparable to PAM Ausvit. The demand is less concentrated among larger producers, however.

7.4 Near Infrared

The CRCV is developing near infrared (NIR) technology into a tool that can be carried into the vineyard to test grape quality factors such as sugar, pH and colour. It is suitable for rating or scaling grape quality, determining when to harvest, and identify variations across the vineyard. It should take no more than a minute to test the grapes, noting that several samples would need to be tested.

We asked their interest in this new technology, with this technology being quite popular:

Figure 14 - Level of interest in Near Infrared



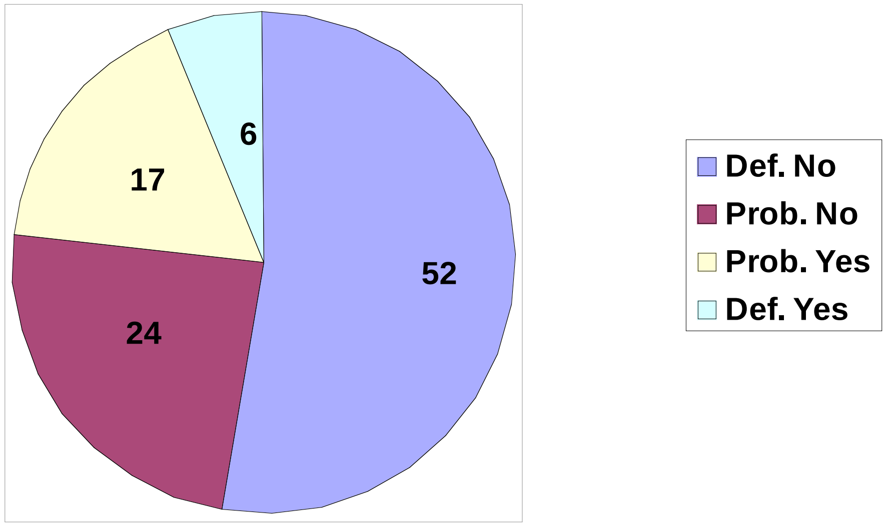
The "definitely" interested percentage was three times higher than that for VineLogic, suggesting that the testing that NIR is designed for would be in demand.

In relation to size categories, those "definitely" interested increased from 34% among those with up to 5 hectares, to 55% among the larger producers. Whilst interest did increase, this technology was seen as reasonably useful even among the smaller producers.

It was also evident that demand for NIR was significantly higher in NSW than in other states, with 60% being definitely interested.

We then suggested a price of $15,000 for NIR, and asked if they would be interested in purchasing it. On that basis, demand was as follows:

Figure 15 - Demand for NIR at $15,000



All those saying that they are "definitely" interested at $15,000 were over 10 ha in size, with demand also being significantly higher in NSW (17% "definitely" yes).

Of the 46 people who were not interested in NIR, a range of responses, all at low incidence, were apparent, and the following were mentioned by more than one person:

- Happy with the existing system of testing (N=7)
- Price/cost (N=5)
- Vineyard too small (N=5)
- Does not test for flavour (N=5).

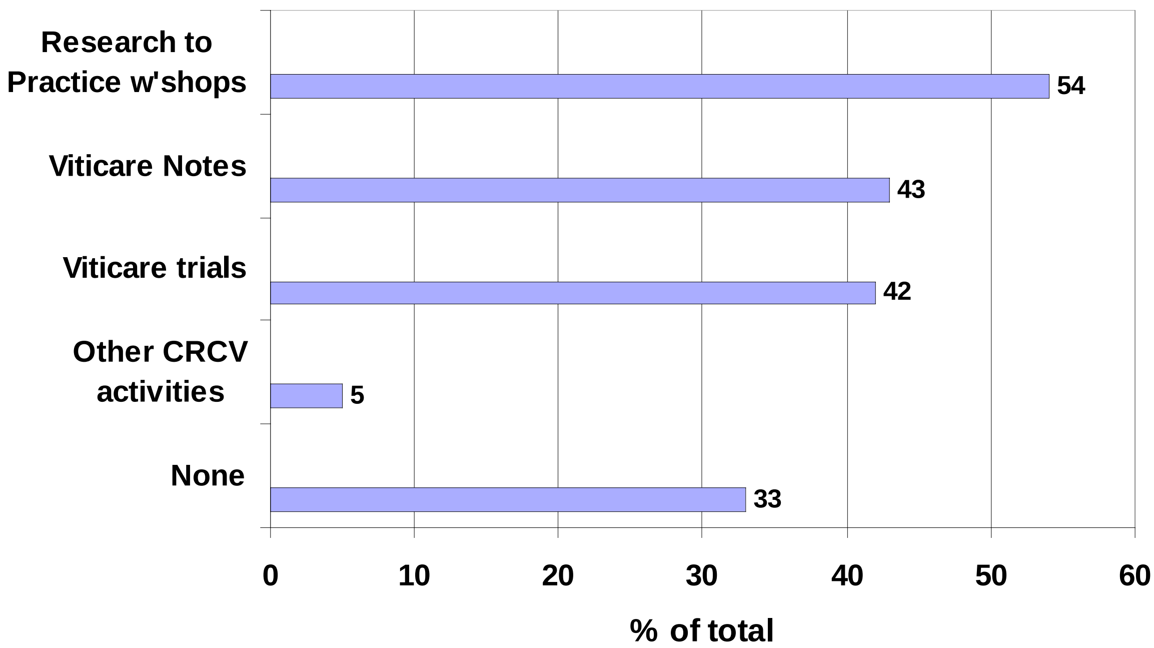
Overall, there is considerable interest in NIR, based on the assumption that it will in fact deliver the benefits suggested to respondents. At $15,000, demand is limited, though larger producers especially those in NSW, were quite interested.

The above suggests that it is worth continuing with the ongoing development of NIR, accepting that pricing will limit potential adoption.

7.5 Viticare Projects

Awareness of Viticare projects was as follows:

Figure 16 - Awareness of various Viticare actvities



Overall, Research to Practice workshops were known by over half, more so than activities which have Viticare named with them. Viticare Notes and Viticare Trial activities conducted under the Viticare name were known to over 40%.

Awareness of all the above increased with size, and the variations are noted in the table below:

Table 10 – Awareness of activities

Activity	Up to 5 ha %	5-10 ha %	11-50 ha %	Over 50 ha %
Research to practice w'shops	36	51	65	70
Viticare Notes	18	49	52	60
Viticare Trials/ On-farm trials	25	42	46	63
Other CRCV activities	4	2	7	5
None of these	54	33	19	18

Those having any contact with Viticare or CRCV projects were asked to describe the benefits, and the following emerged:

- Access to new information (40%)
- Learned new techniques or methods (31%)
- Better environmental management (8%)
- Improved fruit quality (4%).

It was also evident that the more experienced producers learned more from their involvement than the relative newcomers to the industry.

In relation to other activities:

- Of the total, 53 people (27%) had been involved in **regional activities of the CRCV**.
- The incidence increased from 23% (up to 5 hectares) to 52% (over 50 hectares)
- 20% of the total receive **Viticare eNews Bulletins**, again more often the producers with over 50 hectares (42%)
- Interest in the adoption of **sustainable vineyard practices** was limited, with only 6% being “definitely” interested, and 35% “probably” interested. Interest was not correlated with size. This suggests a lack of commitment to it, and arguably a need for more information and assistance to this sector.

8. General Attitudes to Information

This section considers responses to a series of attitude statements from the survey. Please note that this section was covered in the irrigation area grower survey in 2003, and in some cases, we have discussed variations with that survey.

The following table summarises the responses. All data is percentaged.

Table 11 - Attitudes to information

Attitude	*Strong Agree %*	*Agree S/wha %t*	*Neut-ral %*	*Disag. S/what %*	*Strong Disag %.*	*D.K. %*
There is **not** enough information available to help me run the business	4	5	10	39	43	0
I don't get the **right type** of information I need	3	7	11	42	39	0
Information provided by most sources is **too detailed** for my needs	3	15	13	45	25	0
Many sources of information present the **same type** of information	18	55	14	12	3	0
Different sources provide contradictory or inconsistent information	10	22	19	35	14	1
I don't get the **time** to read much of the information I receive	17	37	16	19	12	1
Things aren't bad enough yet for me to read all the information I get	14	14	17	22	31	4
The information needs to be more relevant to my **local area and climate**	26	28	7	27	12	1
There is plenty of information available, but its not provided the **right way**	4	16	18	46	16	1
Technical information like production, nutrition, irrigation, is **more** important than business information like marketing, finance, personnel, etc	12	23	22	24	20	1
More emphasis is needed by the industry to **implement change** rather than provide information about it	10	30	23	28	7	5
Information provided needs to move from paper based to electronic media	11	26	21	25	17	1
I am happy with the **amount and quality** of information I receive	28	48	11	11	3	1

We make the following points:

A. There is Not Enough Information

The level of disagreement with this statement (82%) suggests that there is no real lack of information. Only 9% agreed (netting strong and somewhat agreement). Variations across sub-groups were minor.

Results were similar to those of the Grower Survey in 2003.

B. Getting the Type of Information They Need

Most believed that they do get the information they need, with only 10% disagreeing. Overall, 81% disagreed, the others being neutral.

Views were more positive than the Grower Survey results, where 25% said they do not get the right type of information.

C. Amount of Detail

Views were generally favourable, with 18% agreeing that the information from most sources is too detailed. Larger producers were more likely to disagree that it is too detailed.

In the 2003 Grower Survey, views were less positive, 28% saying that most information is too detailed.

D. Many Sources Present the Same Type of Information

There was majority agreement with this statement, with 73% agreeing. There were no sub-group variations of note.

The result from the 2003 grower result was equivalent.

E. Different Sources Provide Contradictory or Inconsistent Information

The 2003 Grower Survey suggested that this may be a source of dissatisfaction and confusion in the industry, with 52% agreeing.

In this current survey, views were mixed, with 32% agreeing, and 49% disagreeing. However, this is significantly more positive than in the 2003 survey. It is still something of an issue, though not as acute as among commercial growers. Note that the larger producers were more likely to agree with this statement.

F. I Don't Get Time to Read Much of the Information I Receive

More agreed with this statement (54%) than disagreed (31%), suggesting that producers do pick and choose what they will read. There were no variations of note.

Results were similar to the 2003 Grower Survey.

G. Things Aren't Bad Enough for me to Read all the Information I Get

This statement was agreed to by 28%, and disagreed with by 53%. There was more agreement in NSW (43%).

Even though a minority agreed, it does suggest that for many, information is a relatively low priority. That is, they see it as a way of fixing problems, not identifying opportunities and seeking improvement. Reading information is at least to some a "grudge" activity.

Results were equivalent to the 2003 Grower Survey.

H. Information Needs to be More Relevant to My Local Area and Climate

Overall, 54% agreed with this statement, and 39% disagreed. Negative views were more evident in NSW (61% agree) and among smaller producers (61% of those with up to 5 ha). This suggests that information needs to be either more regionally targeted, or the relevance of generalised information needs to be explained.

The 2003 Grower Survey revealed less favourable attitudes overall, with two thirds agreeing.

I. There is Plenty of Information Available, but its Not Provided the Right Way

Most disagreed, being 62% compared to 20% agreeing. There were no regional or other variations. Overall, there is reasonable satisfaction with the way it is provided.

Attitudes were more favourable than in the 2003 Grower Survey, where 38% agreed.

J. Technical Information is More Important than Business Information

Of the total, 35% agreed that technical information is more important than business information, yet 44% disagreed. Overall, business information was seen as marginally more important. The larger and more experienced producers were more likely to say that business information is more important.

Compared to the 2003 Grower Survey, this survey indicates a stronger business focus. More growers in 2003 opted for technical information as the more important (52% vs. 38%).

K. More Emphasis Needed on Change Implementation than Information

Views were quite evenly divided, suggesting that the current mix of information and implementation is suitable. Overall, 40% agreed and 35% disagreed. The larger operators were more likely to disagree.

The 2003 Grower Survey indicated mixed results, yet a leaning toward more emphasis on implementation.

L. Information provided needs to move from paper based to electronic media

Views were mixed, suggesting that a progressive move from paper to electronic methods is wanted. Overall, 37% agreed, and 42% disagreed. The smaller producers were more likely to want to remain with paper.

Despite the support for paper, it was evident that the result was more in favour of electronic than the 2003 Grower Survey (only 20% agreed).

We suggest that over time, producers be migrated to electronic media, though in the short term, a choice would be necessary.

M. I am happy with the amount and quality of information I receive

Overall, satisfaction is fairly high, with 76% agreeing, and 14% disagreeing. No meaningful sub-group variations arose.

The 2003 Grower Survey gave similar results.

Overall, we make following comments:

- **Attitudes for the most part are reasonably favourable. Producers are fairly active consumers of information and attitudes to that information were positive in most cases, both in terms of getting enough information and the right type of information**
- **Information provided seems to have an appropriate level of detail, though information from various sources can be repetitive and contradictory**
- **One concern is that much information is not related to their local area or conditions, a point which emphasises the need for local information dissemination**
- **As has been noted in previous surveys, there is a tendency to rely on information as a problem solving tool, rather than being used opportunistically. Much information is not read, and for some, it is used when things are bad, not good**
- **The mix of information – business and technical – seems appropriate, though some need assistance with the implementation of findings, beyond reading about them. Note that business related information was valued by these producers**
- **There were mixed views of the need for electronic information. However, with the high level of computer usage (91% and rising), we suggest a migration to electronic forms is happening and can be accelerated by promoting that option.**

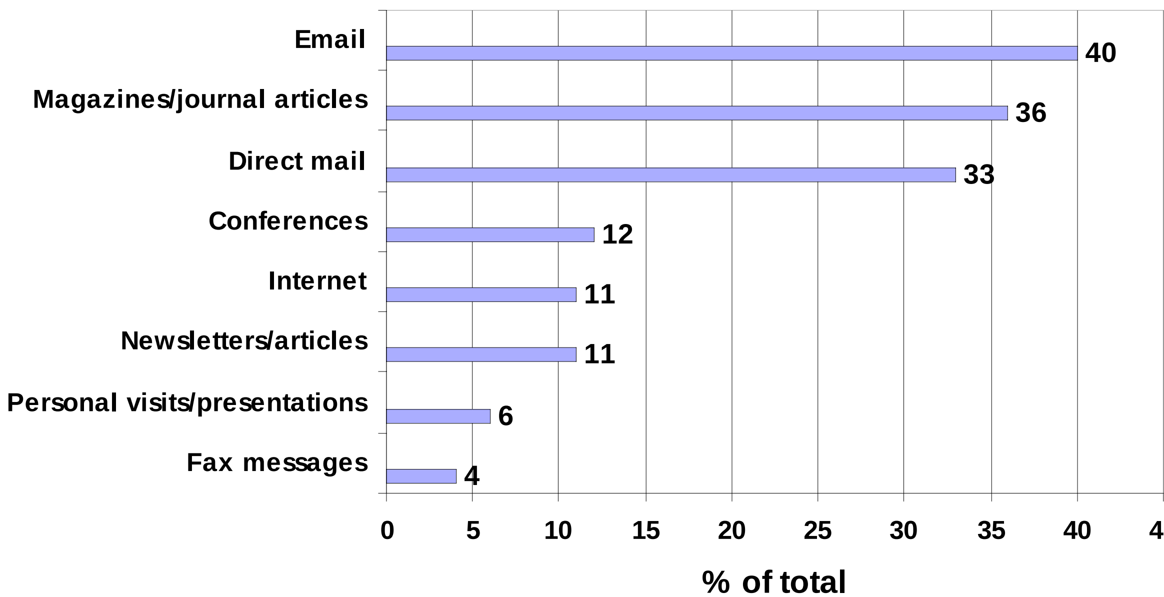
9. *Information Sources and Preferences*

This section considers how information should be provided, including existing sources.

9.1 How They Prefer to Receive Critical Information

Figure 16 below summarises preferred channels for information.

Figure 17 - Preferred way to receive critical industry information



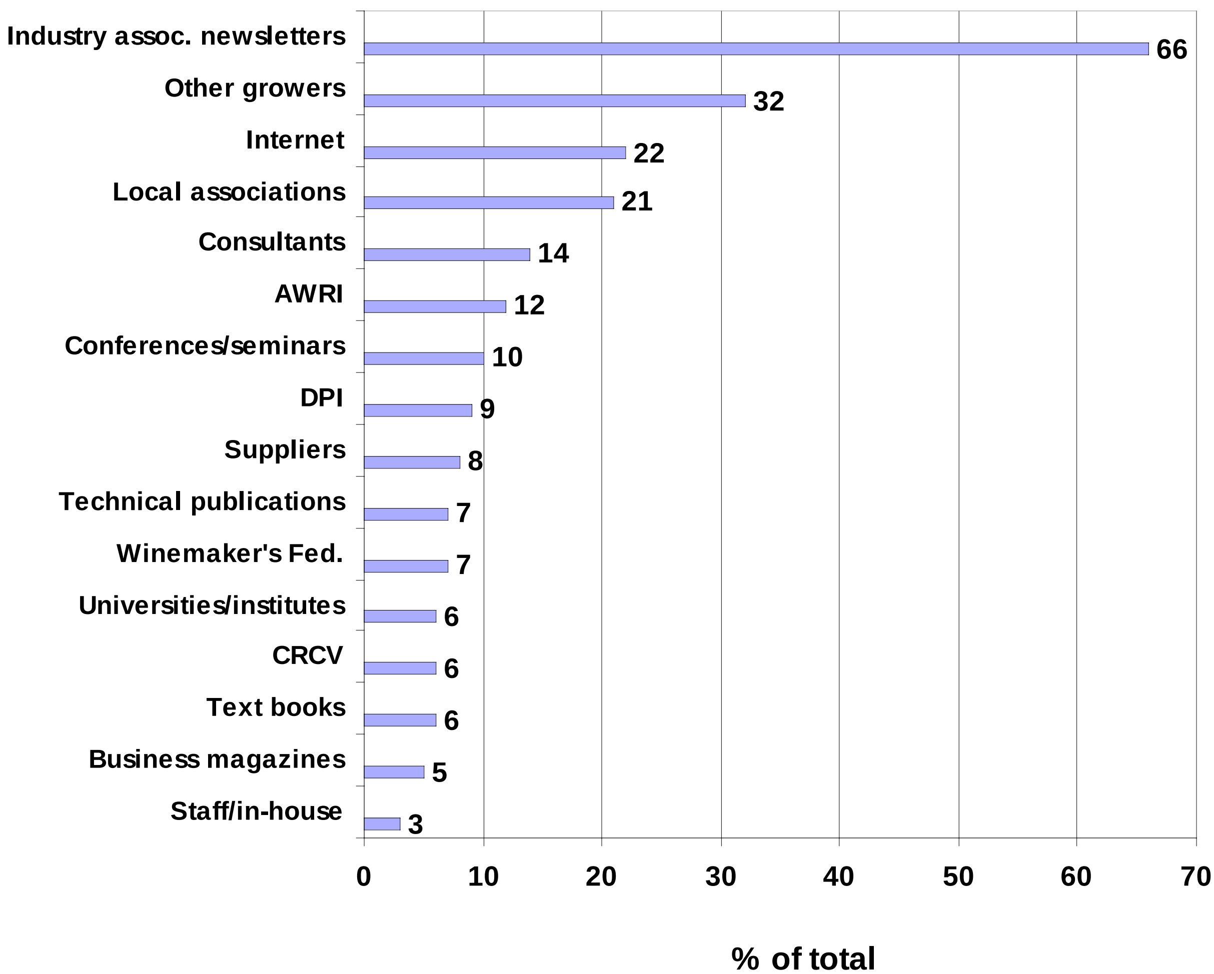
The above figure suggests that email is now an acceptable channel for critical information, as well as written information like articles and direct mail. The larger producers in particular wanted email and also Internet access.

For some, there was a preference for presentations and other personal information delivery. Whilst this is only a minority of the total, the attitudinal data does suggest that some do need more hands-on explanation of information. That is particularly true for major changes.

9.2 Existing Sources of Information Used for Viticultural and Winemaking Information

The following were the main sources presently relied on for information:

Figure 18 - Current sources of viticultural and winemaking information



Overall, there are many sources used, though the main sources are local, viz:

- Industry association newsletters and also other communication from them
- Other wineries or neighbours
- Consultants.

The Internet was also popular, being used by 22%, and particularly by the larger operators. Interestingly, the usage of just about all sources of information, from local associations, the AWRI, Conferences, etc, were used more often by the larger producers.

10. Media Awareness, Usage and Attitudes

This section looks at the usage of and attitudes to magazines and other media, including both industry and consumer information.

10.1 Overall Usage and Attitudes

This section of the report deals with publications and the data is being kept confidential as it contains commercially sensitive information. Any enquiries should be directed to Ian Atkinson, CRCV Technical Applications Manager, ph 08 8303 9304 or ian.atkinson@crcv.com.au

Awareness, usage, readership and attitude data was collected for 8 major publications. Overall, awareness and readership was high. Consistent with most other indicators in this survey, awareness and readership consistently increased with the size of the property. For example, readership of Magazine A increased with size from 68% to 98%, and Magazine B from 23% to 55%. In terms of how useful these publications are, most readers were positive, noting that they would not read them otherwise.

10.2 Overseas Magazines

Readership of overseas magazines was relatively low, with the most popular being the British wine magazine, Decanter. Overall, incidence was as follows:

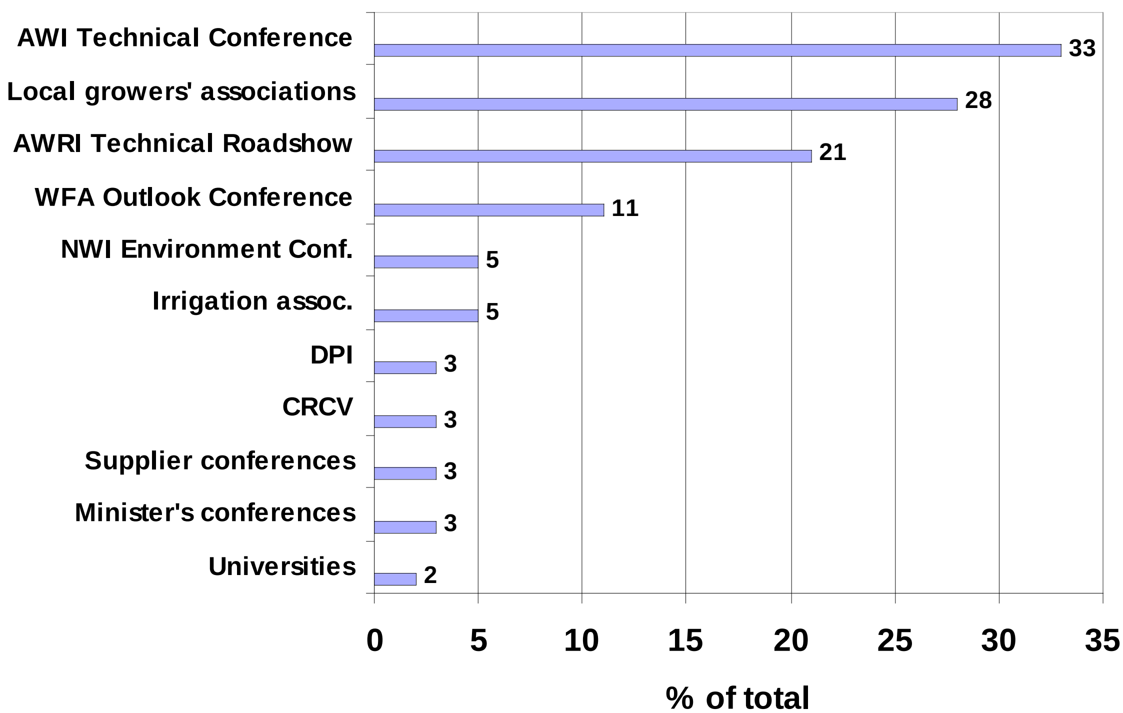
- Decanter: 5% (15% of those with over 50 hectares)
- American Journal of Oenology and Viticulture: 4% (and mostly by larger producers)
- Wine Spectator: 2%
- Practical Vineyard and Winery: 2%.

11. Seminar Attendance and Attitudes

This section discusses attendance at seminars and conferences and attitudes to them.

Of the total interviewed, three quarters (75%) had attended at least one conference or seminar in the last 2 years, with the following figure outlining attendance, based on the total sample:

Figure 19 - Seminars or conferences attended



The Australian Wine Industry Technical Conference and also the Technical Roadshow was particularly popular, followed by those held (in cumulative form) by local associations, then the Outlook Conference of the Winemaker's Federation.

Again, seminar and conference attendance was higher among the larger vignerons, and note that in the case of the AWI Technical Conference, attendance was 7% for those with up to 5 ha, and 53% among those with over 50 ha. In the case of local association conferences, attendance was 16% and 28% respectively.

Whilst overall attendance was high, it is clear that many smaller producers are not attending them, thus missing out on new information and ideas.

For the most part, view of the utility of seminars and conferences was generally positive. The following table summarises ratings:

Table 13 – Value of conferences and seminars

Industry Event	Useful Rating			
	Very %	Quite %	Limited %	No use %
WFA Outlook Conference	44	41	6	0
AWI Technical Conference	41	49	8	0
NWI Environmental Conf. and Exhibition	14	71	14	0
AWRI Technical Roadshow	66	22	9	3
Local Growers' Association conferences	55	33	12	0
Irrigation association or suppliers	71	29	0	0
CRCV	100	0	0	0
DPI	80	20	0	0

Overall, views of the usefulness of these conferences and seminars was high, with very few rating any as being of no use to them. The NWI Environmental Conference was less positively rated, though still quite well regarded.

In the case of the CRCV, note that there were only a handful of attendees, thus the 100% figure is based on data with limited reliability.

The reasons why any seminar or conference was useful are outlined in Figure 20, overleaf. Overall, they are typically looking for **new information and particularly ideas**, and to some extent, **making contacts**.

Figure 22 then outlines the **specific topics** that were considered most useful. To make sense of this data, it has been aggregated across all conferences and seminars attended, rather than being based on each individually. This suggests the following:

- Winemaking and vineyard management information were the most important
- Next came grape quality, new R&D information and pest and disease management
- Following the above, was irrigation and water usage, marketing, then business information and industry changes.

Figure 21 - Reasons why conference or seminar was useful

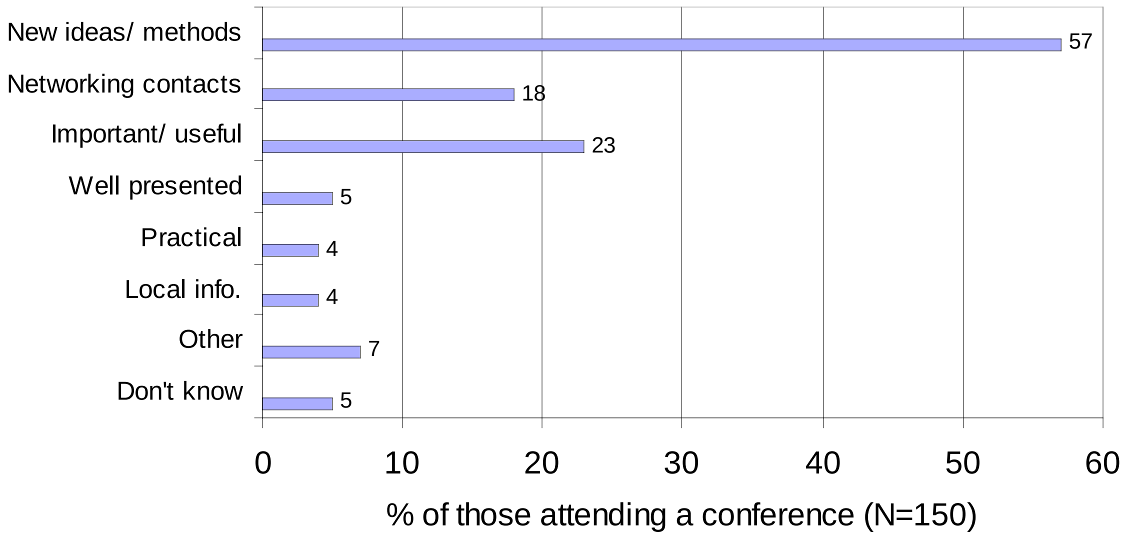
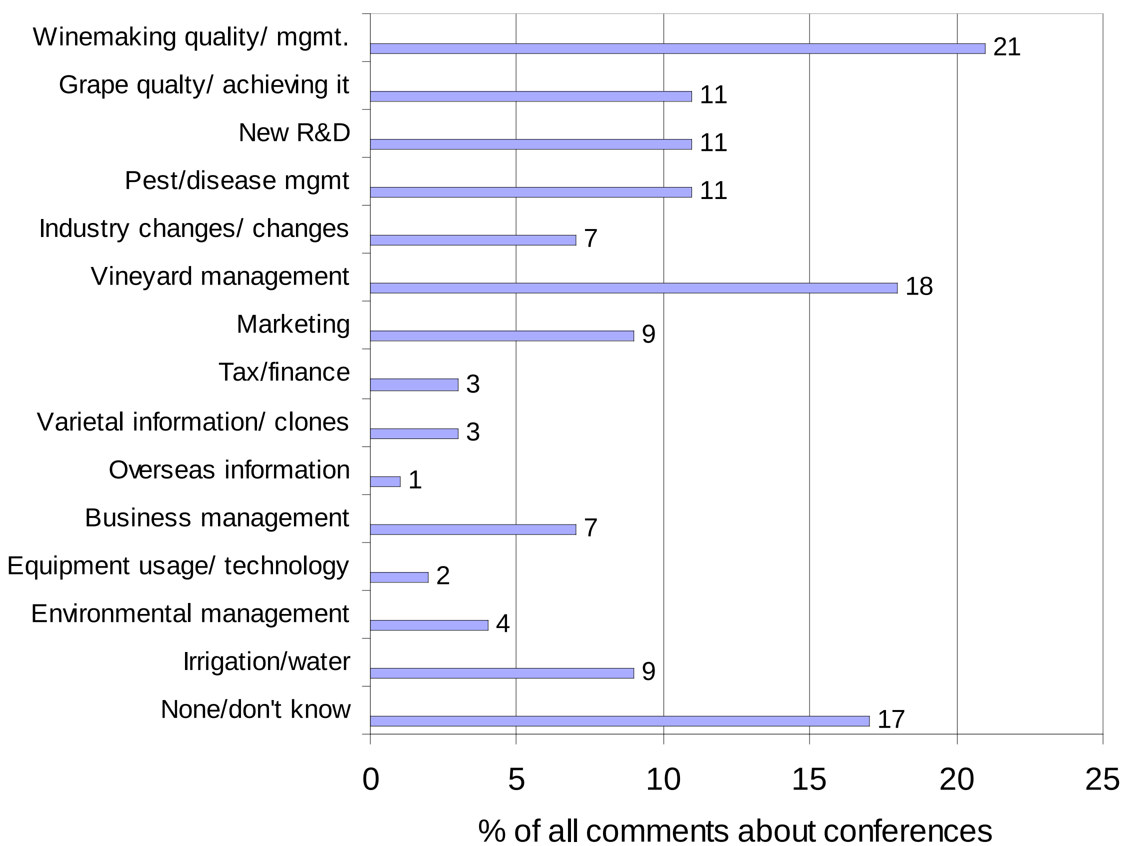


Figure 22 - Seminar topics of most use



END OF REPORT