

Riverland Wine Industry Development Council Inc.

Hibernating Vineyards

With the cold chills of winter thrust upon us, it is with some strange irony that one stops to consider hibernation. Irony aside, 'hibernation' and 'mothballing' are two terms that have been bandied around our industry for some months now. Unfortunately, whilst most would prefer the romantic notion of curling up in a warm place to sleep away the winter, the reality is far harsher.

The Winemakers Federation of Australia's (WFA) vintage report comes with the announcement that the national 2006 vintage crush was yet another large one, falling 4% short of last year's record at 1.846 million tonnes. The report goes on to say whilst the 2006 intake was slightly lower than last year, it is still likely to place upward pressure on wineries stock levels. From this one can assume the oversupply will continue for some time yet.

The Riverland (and other warm irrigated regions) is perhaps feeling the brunt of the oversupply at present - though it should be said that some varieties are performing better than others (Viognier, Sauvignon Blanc). The outlook, particularly for growers without a commercially sustainable contract is not positive. Some growers are thus faced with the stark realisation that even if they can sell their grapes they are unlikely to cover the costs of production.

Despite this, all the indications suggest that longer term the region is well positioned. The facts are, *Popular Premium* exports continue to grow and that is good news for our region. Consumer preference for our wines in major international markets confirms that our product is as good as anyone else's in the world.

With the current market conditions (oversupply, retail consolidation, strong \$A, global competition) promoting unsustainable production and longer term indications suggesting a more positive future, it is only reasonable that one should explore the option of hibernating vineyards.

A definition

The terms 'hibernating' or 'mothballing' of vineyards are by no means making reference to the direct alteration of the physiological state of the vine. Instead they relate to a philosophy that recognises the need for sustainable production and reduced economic losses. This philosophy recognises that the best way of achieving such a goal is to remove unprofitable components (vines) from production. This may, or may not, involve ways and/or means to abort a crop and goes far beyond the basic notion that purely selling the crop is good enough.

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Know your numbers, Know your risk

At the recent (31/5/06) "Take the Bull by the Horns" seminar held by the Murray Valley Grapegrowers' Inc, Tim Pethick (Founder of Nudie Juices) used the following quote "40% of business that don't have a plan, fail to recover from a disaster".

With the wine industry now in the midst of a significant downturn those without a strong business plan may find the journey tough going. A key component to planning is; to know your numbers and know your risk (RWGA, 2005). Having a basic budget in place will allow operators to make informed decisions involving their business and evaluate their performance.

As with any long term proposition, stakeholders must prepare themselves for market volatility. There will be highs and there will be lows, and this has been the cycle since 'Adam was a boy'. Business plans need to recognise this and should act to model the effect of changing prices and expenses on business performance and formulate contingencies based on this information.

The premise of whether to hibernate a vineyard, or not, must start with a realistic business assessment, a plan with a model. After all the act of 'hibernating' or 'mothballing' a vineyard is acknowledgment of the fact that things need to change. Business can not just simply roll on the way it has. Costs need to be reduced and losses minimised.

Pruning

Pruning represents a large cost in any vineyard management program and as a result presents an opportunity to reduce losses. The choice of whether to prune, or not, has a number of potential ramifications to the longer term performance of a vineyard.

Minimal pruning is not new and has proven to be quite successful when managed appropriately (Clingeleffer & Krake, 1992). However many wineries have moved away from minimal pruning and thus the perception of having a minimal pruned block may need to be managed when considering future fruit sales.

The act of not pruning vines could lead to canopy structure issues, as indeed could loose box hedging without the appropriate hand clean up. Should the vines continue to grow unchecked for a number of years the canopy structure will deteriorate. In order to return the vines to a more manageable state a considerable reworking will be necessary and substantial crop losses, in that given year, will be incurred.

Pros of reduced pruning inputs

- Significant savings can be made on the cost of running the vineyard.
- Minimal pruning is not new and can be successful when managed properly.

Cons of reduced pruning inputs

- Perception to potential buyers now and in the future.
- Can be difficult to manage.
- Canopy structure can deteriorate over time.
- Vines may need significant reworking to bring them back into production.

To pick or not to pick?

Whilst there is a real need for a proportion of the regions grapevines to be taken out of production in the short term, this should not be done at the longer term expense of the vines. Efforts must be taken to manage the carbohydrate reserves within the vine. A report to the GWRDC by Holzapfel (2004) covers a number of manageable factors, post harvest, that determine the accumulation of carbohydrate reserves and can be found at: <http://www.gwrdc.com.au/downloads/ResearchTopics/CSU%2099-2.pdf>

Holzapfel in his extensive report explains that the length of the post harvest period can significantly impact on carbohydrate reserves and vine productivity. That is to say that leaving the fruit on the vine will adversely impact on the carbohydrate accumulation of the vine. With this in mind the decision as to whether to remove unsold fruit from the vine or not becomes a little clearer.

Over a single season the impact of leaving the fruit is unlikely to be of significance, given the circumstances, particularly if the vines are to continue in hibernating mode. However, continued depletion of carbohydrate reserves will affect the performance of the vine post hibernation and this will need to be monitored.

Leaving fruit on the vine will also have implications for pruning and pest and disease management. Pruning will obviously be made more difficult if the crop is left on and the cost as such, is likely to increase. Leaving the fruit on the vine will provide opportunity for pest and disease to establish and develop a level of inoculum for seasons to follow.

Pros of leaving fruit on the vine (unharvested)

- Savings on picking costs

Cons of leaving fruit on the vine

- Depletion of vines carbohydrate reserves
- Reduced productivity of the vine post-hibernation
- Increased P&D pressure
- Increased pruning costs

Nutrition

Again there are potential savings to be made by reducing or eliminating the nutritional inputs of a vineyard. However, it is important that one considers the status of the vines prior to reducing these inputs and determines whether or not that vine may be required to carry fruit for an extended period of time. The possible deleterious effects of nutrient deficiencies should also be considered.

A vine that has low nutritional status and a requirement to carry a crop, that may not be picked at all, could suffer longer term effects via a reduction in it's carbohydrate reserves. The relevant stresses placed on the vine will need to be monitored, particularly as the time to bring the vine back into full production approaches.

Pros of reduced nutrient inputs

- Significant savings can be made via the reduction of inputs and associated costs.

Cons of reduced nutrient inputs

- Vines with low nutrient status that are expected to carry a crop for an extended period could suffer longer term effects.
- Vines could suffer from deficiency problems.

Spraying

The notion of hibernating vineyards infers that vines will be taken out of production and the fruit quality as such, during that period of time, is of no real consequence. Having said that there are a number of issues that will need to be considered when determining whether to act against pest and disease.

Obligations to neighbours and risk of disease spreading to other (profitable) varieties within a vineyard are major concerns. This does not mean that a full spray program will need to be implemented but rather requires a program that covers the risks...three or four sprays may be required to stop powdery mildew from spreading.

Perception, again, could be a problem. When the time comes to bring the vines back into production buyers may be hesitant if the block has a history of pest and disease – this infers the block



will have a high, carry over level of inoculum that will need to be effectively dealt with post hibernation.

However, if reduced water and nutrient inputs are part of the hibernating mode then canopy size should be reduced and UV light will play a role in the suppression of powdery mildew and induce phytoalexins that are fungitoxic (Keller et al 2003, Bonomelli et al 2004).

Pros of reduced spray inputs

- Reduced costs (chemicals, diesel, time and maintenance).
- Increased savings.

Cons of reduced spraying inputs

- Perception.
- Increased level of disease inoculum for future seasons.
- Increased risk of spread.

Irrigation

Given that the production of a crop is of little consequence, when hibernating vines, much can be done to reduce water inputs. The impetus of a water regime must, thus, focus on keeping the vine alive and maintaining its potential to produce when necessary.

The timing of when to introduce water inputs will very much depend on the status of the vine at any given time. Watering through flowering and set becomes less critical - a poor set could actually be favourable to the vine and act to reduce the requirement for water later in the season.

As with nutrition, if a crop is going to be carried throughout the year and long into the growing season, water will be required to maintain the longer term health of the vine.

By encouraging a smaller canopy size, benefits will be received via reduced pest and disease pressure. Fruit exposure should not be a major concern if the vines are being taken out of production. However should the block get badly burnt there is, again, the issue of perception to potential future buyers.

Pros of reduced water inputs

- Reduced costs
- Increased savings
- Potential to sell temporary water allocation.
- Potential to use the water for the production of an alternative crop.
- Potential to leave water for environmental purposes.

Cons of reduced water inputs

- Increased risk of putting the vine under undue stress.
- Excessively stressed vines could suffer in following seasons.
- May reduce the capacity of the vine over a long period of time.
- Perception to future buyers.

Chemical inhibition of crop development

There have been a number of suggestions put forward regarding the best way to prevent crop development. The use of products such as urea and calcium nitrate has been mentioned with regard to completely burning off the canopy and letting the vine recover. The fear with methods such as these is that treatments over a number of successive seasons may lead to a depletion of carbohydrate reserves in the vine and reduce its capacity.

Perhaps most interest has been generated by ethephon containing products such as Ethrel® (Bayer CropScience). A grower in Mudgee was reported to have used the product to good effect last season. The vines were sprayed (twice) immediately post fruit set at a cost of \$17/ha (as per com T. Clancy, GWRDC).

A major benefit (when hibernating) to inhibiting the development of the crop comes as the major sink, the fruit, of the vine is removed and thus the inputs required to service that vine are much reduced. Words of caution are however warranted particularly given Ethrel® is an S6 chemical and an anticholinesterase compound. Care should be taken, if the product is used, to not only protect the individual spraying but minimise the impacts on beneficial insect populations in the vineyard.

There is some conjecture as to the effect of ethephon on the developing bud (yield depression in the following season) and it would appear that responses are likely to be variety dependent with both the rate of application and the timing of application being crucial ingredients.

Szyjewicz and Kliewer (1983) reported that ethephon applications of 750ppm to the whole (Chenin blanc) vine (point of run-off) at 0, 1 and 2 weeks after full bloom showed toxicity effects on the rachides (bunch stems) within a week of application, with "withering and complete abscission following shortly after". Total or near total drop of clusters combined with the ability of ethephon to abort the growing tips, redirected photo-assimilates and consequently produced a flush of growth from the secondary and tertiary buds of the existing compound bud(s). These less fruitful shoots, in the absence of competition, grew vigorously for the remainder of the season. No mention was made in the report as to the effects of the applications on the developing bud.

A study conducted by Levee et al (1977) noted that ethephon at 480ppm (applied to the upper part of the shoot) had no negative effect on bud differentiation, bud opening or growth in the following season. However, it must be said that the level of chemical used in the experiment is unlikely to effectively remove bunches – although it was reported that fruit development was damaged when ethephon from the upper part of the shoot dripped down to the bunch. Eynard et al (1975/1977) on the other hand, reported that 2000ppm of ethephon applied post harvest to remove leaves had an effect on bud burst and yield the following season and that some varieties were more susceptible than others. Szyjewicz et al (1984) in a paper reviewing ethephon use in viticulture indicated that applications during dormancy and excessive rates during the fall had led to adverse effects on vegetation and yield in the following season. Hedberg and Goodwin (1980) whilst experimenting on factors affecting grape berry abscission (harvest aid) found that grape cultivars varied in their sensitivity to ethephon and required specific rates so as to induce adequate berry loosening without excessive leaf drop.

What is clear, from a quick review of available literature, is that it is very hard to find any published work on the use of ethephon for inhibiting crop development in grapevines. Anecdotally there have been claims that ethephon has been used to great effect, for this purpose, with little or no adverse experiences noted in the following season. From a vine physiology point of view, there are arguments that one could make either way. However, with the information available at present, it would be unwise to proceed without considering the possible side affects of any such action and thus, the experiences of the authors as stated above should stand as words of caution.

Further to the discussion on chemical inhibition it would be foolish for one to proceed without clearly stating that Ethrel® is only registered for use (in wine-grapes) on Semillon as a harvest aid. *Before proceeding with any use of Ethrel® it is advised that professional opinion is sought.*

Pros of chemically inhibiting crop development

- Removal of the crop reduces the requirements (water, nutrient, spraying) of the vine and allows for potential savings to be made via the reduction of inputs.
- Inhibition of crop development is cheaper than harvesting the fruit onto the ground and removes any P&D issues involved with leaving the fruit on the vine.
- The fruit is effectively removed thus leaving nothing to inhibit pruning should it be carried out.
- The demand on the vine is greatly reduced thus the health of the vine under a reduced input scheme should be more easily maintained.

Cons of chemically inhibiting crop development

- Little published work is available on the use of chemicals in this manner.
- There is conjecture about the possible affects of ethephon (Ethrel®).
- Use could potentially affect the developing bud and result in decreased vine productivity the following season.
- Effects could be variety dependent.
- Ethrel® is an anticholinesterase and could impact on beneficial insects within a vineyard.
- Early removal of crop could induce excessive vigour.
- Canes produced from secondary and tertiary buds are likely to be less fruitful and will make pruning decision much more critical.

Alternative management/cultural practices

There are many and varied alternative management or cultural practices that could impact on the production costs within a vineyard. Vineyard floor management, for example, is one such area. Given the circumstances faced by many growers and the nature of the dwindling returns for grapes, perhaps the use of cover crops needs to be reconsidered... could an alternative, commercially viable, crop be planted in the mid row instead?

An option mentioned by Ben Rose (Viticulture Consultant) at the seminar held in Mildura was to remove the cordon of the vine (operation chainsaw) and leave the trunk to re-shoot. In the following seasons a review of the market situation will determine whether the new canes are wrapped onto the wire or knocked off (leaving the trunk to re-shoot, again). Consideration would have to be given to the affects on carbohydrate accumulation, how dense regrowth could affect bud fertility and wound protection against Eutypa.

At the recent (2/6/06) Barossa “Weathering the Storm” seminar the use of sheep was raised as an alternative to the use of herbicides and de-suckering. Naturally if noxious weeds are a problem then effort will have to be maintained but it is the principle that is important here. The questions are: Are the practices within your vineyard the most efficient for your circumstance and will they buy you enough time to see the recovery of the industry?

Could complete removal of vines be a viable alternative?

Having discussed the many variables involved in hibernating vineyards one must realise that over a period of time, the reduction of inputs into that vineyard are likely to affect the capacity of the vines to produce. Thus with any such action, it must be recognised, that the longer it proceeds the more difficult it will become to bring that vineyard back into full production, within the season of its requirement. If hibernation were to continue for a 3 to 4 years it could take a number of years to bring those vines back to the previous levels of production. This being the case an economic analysis of the situation (including variables such as; vine age, variety, existing infrastructure and future direction) should be explored to determine the benefit, or otherwise, of completed removal of vines over hibernation in any given time frame.

Managing relationships

It is important that effective communication with all relevant stakeholders is maintained through these somewhat difficult times. If for example, one is contracted to a winery that is unable to meet sustainable purchase conditions, the decision of whether to hibernate your vineyard should be discussed with them.

Surprises are great for birthdays but generally not that well received when part of a business relationship – keep wineries, banks etc. well informed of business plans and future directions.

Hibernating vineyards is an interim measure and plans need to be in place for when the market provides more favourable trading. As the market turns it is important that communication of intentions to deal with the vineyards post-hibernation are delivered to stakeholders and potential customers. *Act with integrity, recognise it in others and work to maintain those relationships.*

Concluding remarks

There is one certainty amongst the confusion that currently reigns as a result of the industry’s present difficulties and that is; **things must change!** Many within the industry cannot afford

to simply maintain the status quo. Belts need to be tightened and new opportunities found. Market volatility is an inherent part of the system and plans need to be in place to cope with such conditions.

Informed decision making is the key to future success. There is no one solution that will suffice for all. As such the purpose of this article is not to proclaim any great solutions but rather, foster an understanding so that individuals can explore options that are relevant to their business and circumstance.

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Acknowledgements

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2006 WFA Vintage Report
<http://www.wfa.org.au/PDF/2006%20Vintage%20Report.pdf>

Acknowledgement must also go to Murray Valley Grapegrowers' Inc, the Barossa Viticulture Technical Group and all involved in their seminars.

Optimal Ripening of Cabernet Sauvignon and Shiraz

July, one of the quietest months on the grape growing calendar, is deliberately chosen by the Australian Society of Viticulture and Oenology (ASVO) as the appropriate time to hold its annual viticulture seminar. This year it will be held at the Mildura Arts Centre on Friday July 21 with proceedings being linked by teleconference to WA and Qld.

ASVO seminar organising committee member Kerry de Garis of the Hardy Wine Company says the event is "a must" for those who want to keep pace and normally attracts more than 300 registrations.

"Our industry has a very active research component which is there to assist us to be innovative and remain competitive. The seminar title reflects grower interest in vine physiology, particularly influences on the make-up of grape berries."

"Studies both here and overseas have greatly expanded knowledge in this area and results have even questioned some widely held beliefs. In particular we have come to understand more about the soil, water and vine interactions, the way a grapevine functions and the differences that exist between varieties and between sites."

One of the key speakers this year will be US researcher Mark Matthews from the University of California, Davis, whose subject will be the influences on Cabernet Sauvignon wine grape composition.

Other presenters will include:

- Steve Tyerman of the University of Adelaide (whose topic is the source/sink balance from veraison onwards);
- CSIRO researcher Simon Robinson (colour and tannin development); the University of Adelaide's Renata Ristic (phenolic compounds in seeds, skins and wines);
- Amy Richards from the SA Research and Development Institute (effects of minimal water inputs);
- Kerry Wilkinson from the Curtin University of Technology (green characteristics of Cabernet Sauvignon);
- Sue Bell of Stonehaven Winery (tracking flavour development);
- Charles Sturt University's John Gray (reasons for variation in size and composition of Shiraz berries);
- Rachel Ashley of Foster's Wine Estates (effects of canopy and irrigation management on Shiraz production);
- Suzy Rogiers, NSW Department of Primary Industries (vascular transport in Shiraz);
- Wendy Allan of Pindarie Wines (a case study in improving Shiraz ripening).

For details contact Val Rechner Ph (08) 8410 9855 or visit the website www.asvo.com.au/news/registration/

Some Like it Hot

Winegrape growers are reminded to lock into the diary **Thursday the 12th of October** for the 2006 'Some Like it Hot' seminar. The Riverland will be the hottest spot in the Australian wine industry as industry representatives from across the region and beyond gather for the annual technical seminar 'Some Like it Hot'.

With a focus on 'up to the minute' information and new technology, speakers at 'Some Like it Hot' are preparing to present on issues such as; global supply and demand, the domestic wine trade, precision viticulture, and global warming's effect on grape growing.

Winegrape growers, winemakers and technical staff in warm climate regions cannot afford to miss this event.

Finlaysons Roadshow heading for the Riverland

Finlaysons will be bringing their Roadshow XIV to the Riverland with the theme 'Batonning down the Batches'.

Berri Resort Hotel

Tuesday 15 August, 2006

Seminar – 3.00pm – 6.00pm

Drinks – 6.00pm – 7.00pm

Topics to be addressed include;

- (a) What can you do if you can't sell your grapes?
- (b) How to manage a wine company in an ultra competitive market place
- (c) Restructuring the business to survive and thrive
- (d) Climate change – what is happening and what it means for the Australian wine industry
- (e) Climate change impact – what wineries and growers can do about it

The charge will be \$99 per person.

For more information on the Roadshow, contact patricia.huish@finlaysons.com.au



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Advancing our environmental credentials through AWIS

The Australian wine industry enjoys an international reputation of being 'clean and green', but what if a major overseas retailer 'knocked on our door' and asked to see proof that our industry is indeed 'green'?

There is plenty of environment management activity already occurring in the Australian wine industry, but we do not have any national framework that brings it all together - at the moment, we can not prove that the national wine industry is 'green'. We need to record all the good work happening in the industry and communicate this to the international marketplace in order to continue to build upon our national brand's value. This is what AWIS is targeting.

Unfortunately we are not breaking any new ground by doing this; California, New Zealand and South Africa have already started with whole of industry schemes of their own. AWIS is the response to the challenge laid down by our competitors, and to the increasing demands by retailers, governments and investment houses for proof of good environmental performance.

The AWIS program is being run by the Winemakers' Federation of Australia (WFA) with funding from the Natural Heritage Trust.

The outcomes sought are improved export market access for Australian wine and real environment improvement. The timing is such that we hope to preempt and indeed avoid more exhaustive compliance schemes such as EurepGAP or ISO 14001 being imposed on Australian wineries and growers.

The AWIS program has three parts:

1. Market reviews

A comprehensive market review will determine what the market place wants from the industry in terms of environment issues.

The first of the reviews; 'Oiling the Chain', is for the UK and European market, and it, along with a three-page summary can be found on the WFA website at <http://www.wfa.org.au/PDF/OTC.pdf>

Future reviews will focus on the US and Asia/Pacific. All reviews are intended to identify market signals in a plain, transparent manner.

2. Assurance scheme

AWIS will pursue the development of an assurance scheme where we can prove that we are delivering what the marketplace and what the environment wants.

Part of AWIS involves an insert being added to company spray diaries, as was trialled in a 2005 pilot in several Australian winegrape growing regions. An example of one of the inserts used can be found at <http://www.wfa.org.au/PDF/AWISinsert.doc>

Our review of current environment activity already occurring in the wine industry can be found at <http://www.wfa.org.au/PDF/AWIS%20sysmap.pdf>



3. Liaison with catchment management authorities

In the case of the Riverland, this is the South Australian Murray Darling Basin Natural Resource Management Board (NRM Boards). It is considered important that the local winegrape and wine industry in the regions develop and strengthen relationships with their respective authorities.

To assist growers and wineries in identifying relevant environment issues and an appropriate response, a number of resources are being developed including;

- a review of all regional natural resource management plans as developed by NRM Boards,
- case studies where all the parts of this program come together, and
- fact sheets on pertinent issues, including biodiversity.

Regional committees to advise AWIS have been formed throughout Australia including one in the Riverland. Meeting outcomes across Australia, as well as details of all regional committee membership are available on the WFA website at <http://www.wfa.org.au/PDF/AWISmins.pdf>

Across this winter there will be workshops throughout Australia, including the Riverland, that will introduce the spray diary insert to wineries.

More information is available from the AWIS Regional Coordinator for Riverland and Sunraysia, Ben Vagnarelli, 0437 650 193 or benv@riverland.net.au

More clues on the AGY puzzle

A disease widespread with cause uncertain and control unknown, was investigated over many seasons up to 2005/06. Known as Australian grapevine yellows (AGY) this disease has been the subject of much confusion and debate. Reasons included a lack of awareness of the symptoms, of the source of disease and how it is spread. Additionally, the disease is epidemic and levels rise and fall from season to season. This made difficult the prediction of disease levels and the determination of its cause and severity.

The disease was similar to devastating yellows diseases in Europe and elsewhere and the threats these diseases posed enhanced local concerns about AGY, especially as they related to the risk of AGY being spread to new vineyards by dormant cuttings, at a time of rapid vineyard expansion in Australian viticulture. This was a recipe for anxiety and a call for action. Australian grapegrowers, particularly in the Riverland, Sunraysia and Riverina wanted some answers – especially concerning the source of disease, how it spreads and “what can I do about it?”



Experiments were conducted in a variety of trials from 1996/97 to 2005/06 on a diverse array of aspects concerning AGY. The symptoms of AGY were

documented and a disorder, often confused with AGY and called Scaly Bark Stunt (SBS), was newly described.

Extensive shadehouse- and field-experiments with cuttings taken from severely diseased vines showed that AGY was not spread by cuttings. Of some 12,000 cuttings tested, none showed AGY. A small trial to test if AGY levels were reduced by pruning-off diseased canes made no difference. The conclusion: factors other than propagation material provide the main source of disease. Interestingly, the latter experiment showed that AGY appears to survive in cordons and spurs and other vine tissue near where symptoms appear next season.

So, where did AGY come from?

To find out, two ways of surveying for AGY in vineyards were devised, tested and applied. When a precise score of disease incidence is needed, a detailed arm survey which scores the AGY status of individual arms (cordons) on both sides of the vine, is best though it takes longer. A point survey that scores the disease status of only the facing sides of two rows at a time, is much quicker (averaging 20-30 vines/minute) but it will under-estimate levels of AGY by ~10% especially in taller canopies.

In extensive surveys over a number of seasons, more than 140 vineyards and in excess of 58,000 vines in 2003/04 were examined and some typical features of AGY became apparent. Analyses of vineyard maps showed that AGY is an epidemic disease with peaks and troughs over the seasons. The disease is widespread across the Riverland, Sunraysia and Riverina – very few vineyards of cv. Chardonnay or Riesling have no disease and yield losses vary from <1% to >30%. Trends in disease levels occur within regions at similar times. The first recorded peak in AGY in the Riverland was in 1978/79; the second in late

1999/00 – 2000/01. Disease levels usually remain high only for 1-2 seasons before declining and new peaks may not occur for a number of seasons. Also, within individual vines, symptoms come and go, the result of the combined effects of natural heat therapy and because diseased shoots die. There is potential to use the significant body of survey data, to gain further knowledge about the disease and how it spreads within the vine and the vineyard.

Additional surveys showed that the source of AGY was not within vineyards and usually, not nearby. The mystery of the source of AGY then began to be solved. Hot spots of disease were located and then gradients of AGY across vineyards found in the Riverland were confirmed in the Riverina and Sunraysia. It became clear that the disease was originating either in wetland or riverine vegetation or in wasteland plants nearby.

High levels of AGY were found to be associated only with native chenopods: a bluebush (yanga – *Maireana brevifolia*) and several saltbushes (ruby saltbush – *Enchylaena tomentosa*, and climbing saltbush – *Einadia nutans*). Then the breakthrough - these plants and an introduced species, false caper (*Euphorbia terracina*), tested positive in molecular (PCR) tests. This was the first record of AGY phytoplasma (AGYp) in native species in Australia.

Other progress is summarised;

- AGY is a disease of vineyards on the margins of viticulture i.e. vineyards bounded by other vineyards have little risk of AGY and, to the contrary, vineyards on the interface between the viticultural region and wasteland vegetation, have a much higher risk of significant levels of AGY;
- the source of AGY is confined to zones within hot spots of dimension as small as ~100m. x ~50 m. and the infective distance of the presumed insect vector i.e. from source plant to the most distant new host, is ~ 600 - 1000 m.
- yanga bush is at least one of the main hosts that serve as an inoculum reservoir for AGYp in grapevines since AGYp was found in PCR-tests of 5 of 48 (10.4%) samples of yanga bush in the Riverland and in 6 of 81 (7%) from across all regions;
- AGY phytoplasma appear to be indigenous (native or naturalised) to the Australian and perhaps the Australasian region;
- the insect vector of AGY most likely feeds and/or breeds on one or more of these plant species; and
- that there is good prospect of locating the presumed leafhopper vector of AGY in or near one or more of the host plants identified above.

While studies of the source of AGY were continuing, so was the search for a means of spread. Insects were suspected as the vector of AGY and various trapping studies were made with help from Riverland Vine Improvement Committee and others. An insect enclosure established for three seasons over a commercial vineyard at Berri showed that levels of AGY were significantly less than in an adjacent vineyard. This provided the first experimental evidence of a mobile vector for AGYp.

This project thus gave support to the hypothesis that an insect vector such as a leafhopper or a planthopper spread AGY from native plants to vineyards.

A series of trapping studies using sweep nets, light traps and sticky traps then showed that;

- yanga bush is the probable over-wintering host of *Orosius argentatus* (common brown leafhopper) in the Riverland

and Riverina regions – previously not known for this almost ubiquitous leafhopper. This is of considerable interest especially given the finding of AGYp on that host;

- leafhoppers fly in high numbers on irregular occasions viz. warm nights with temperature ≥ 22 OC;
- they fly to light sources at near midnight and flight activity appears to be impeded by extreme temperatures eg. > 40 OC during the day, or during windy and/or rainy weather conditions;
- it is probable that these characteristics also apply to the leafhopper vector of AGY and, if so, flight times of the vector and its inoculation of vines would be at irregular intervals each season dependent on the prevailing conditions especially temperature;
- Of the six most frequently found leafhoppers, *Austroasca* sp. and *Batracomorphus argentatus* were abundant and were most strongly correlated with high levels of AGY;
- *B. angustatus* is a prime candidate vector of AGY and should be investigated further since it transmits phytoplasma diseases elsewhere in Australia;
- it showed peak flights on only two occasions in the period of study and the dates of these were detailed with precision;
- *Austroasca* sp. are not considered vectors of AGY because they do not feed on phloem cells;
- *Orosius argentatus* was also abundant but trap counts showed it occurred at sites with varying incidence of AGY. Though it is not likely to be the prime vector of AGY, it should not be ignored.

The insect work showed that further investigations into the vector relations of AGY have good potential to identify the leafhopper species involved. Further detailed analyses of extensive vineyard mapping data will help identify aspects of the biology of the vector of AGY and provide an understanding of the disease in grapevines – knowledge that is essential for the development of a management strategy for AGY.

The present work has resulted in a clearer understanding of the source and means of spread of AGY and has described a potentially new disorder of grapes viz. scaly bark stunt (SBS). The knowledge gained on AGY has laid a foundation upon which to base continued investigation of the leafhopper(s) that spreads disease and the plant host(s) upon which it feeds.

A number of presentations have been made to grower and industry groups in the Riverland and Riverina during the course of this project. In recent examples, a 20-page A5 coloured summary of the present work was presented to industry groups in the Riverland. While recognising that an understanding of AGY is not complete, it is appropriate that further details of AGY be shared in regional workshops in the Riverland, Riverina and Sunraysia so that Australian winegrape growers can learn more details of how to identify the symptoms of AGY and to be informed of progress in understanding the source and spread of disease.

For further information, please contact Peter Magarey at the Loxton Research Centre on 8582 9100.



Native chenopods associated with high AGY

Powdery Mildew

A recent collaboration between SARDI and DPI Victoria involving powdery mildew has shed new light on the topics of; varietal susceptibility, flag shoot development and spray treatments. Whilst more work is required, the potential for developing improved powdery mildew control is great.

Glasshouse studies involving Verdelho, where 1-2% of inoculated buds produced flag shoots, showed that most of those flag shoots were produced from buds aged 1-18 days at the time of inoculation.

In a separate experiment Verdelho exhibited the greatest susceptibility to flag shoot development. Of the two remaining varieties tested Chardonnay was far more susceptible than Sultana. In an indication of their relative susceptibility, both Verdelho and Chardonnay produced secondary flag shoots when their primary flag shoots removed. Verdelho then went on to produce tertiary flag shoots (albeit at a very low incidence) in the absence of the secondary flag shoots.

Spray treatment trials showed that a penconazole (Topas®, 12.5ml/100L) treatment at 2 weeks after inoculation reduced flag shoot incidence in the following season (at 7 and 9 weeks after bud burst). A tank mixture of spiroxamine (Prosper®, 40ml/100L) and tebuconazole (Folicur®, 11.6ml/100L) did likewise when applied 4 weeks after inoculation. A penconazole treatment applied just after bud break in the season after inoculation also reduce flag shoot incidence (9 weeks after bud burst). All treatments were applied to the point of run-off using a hand-held applicator.

In summary: Buds at early stages of development (1-18 days old) are most vulnerable to infection by powdery mildew and varieties differ in their sensitivity to this infection. In the absence of early control, varieties with greater potential for flag shoot production (Verdelho) will be more susceptible to suffering crop loss.

Both the chemistry used and the timing of its use will have a big influence on inhibiting the development of flag shoots. An application of penconazole at 9-10 leaves and/or an application of a spiroxamine, tebuconazole mixture two weeks later (12-15 leaves) could act to reduce the incidence of flag shoots. More work is however required to evaluate other spray treatments and to determine the timing of those treatments for optimum control.

The information in this report was presented to the RWIDC VTG on the 2nd of May 2006 by P. Magarey. The supporting document tabled at the meeting is acknowledged as follows: Emmett, R.W., Clarke, K., Hunt, T.J., Magarey, P.A., Learhinan, N. (2006). Grapevine bud infection by powdery mildew (*Erysiphe necator*): Varietal susceptibility and the evaluation of fungicide treatments to reduce flag shoot development.



CropWatch Survey Results – Feedback Commentary

A more thorough analysis of the results of the CropWatch users' survey conducted earlier this year has provided the CropWatch Sub Committee with a good insight to the views of growers. Some questions provided the opportunity to make comment beyond the 'yes-no' response.

Q: How, if at all, could CropWatch be made more useful to your business?

Many respondents identified that more timely data regarding weather information and weather forecasts would be appreciated;

"Weather earlier"

"5 day maximum temperature forecast"

"7 day wind forecast"

CropWatch users are advised that CropWatch Online (www.cropwatchonline.com) is one tool that growers with internet access can use to be channelled directly to the Bureau of Meteorology website, where a host of weather data and forecasts can be obtained by clicking on the "Weather" link.

The CropWatch weather station network will link in to the River Murray Catchment Water Management Board's Automatic Weather Monitoring Network system for the 2006-2007 growing system that will provide data on;

- rainfall and evaporation,
- wind speed,
- air temperature,
- relative humidity,
- soil temperature, and
- global solar radiation.

This data for each connected weather station will be displayed through linkages in the CropWatch Online website.

One respondent also suggested: "Mobile phone link to alert you about faxes coming in."

The use of SMS messaging as a tool is under consideration and cost quotations are being sought.

Q: Given that you use CropWatch, what impact has it had on your spray program?

While the survey identified that about three quarters of users had modified their vineyard spray programs by applying 'more or less' than they might otherwise have done in light of CropWatch advice, many respondents provided some qualification to their response. CropWatch's impact on timing of sprays was identified by many as an important benefit of the service;

"CropWatch can affect timing; sooner-or-later, not less-or-more"

"Sprayed a similar amount but adjusted timing"

"Better timing. Preventative rather than eradicator"

"Sprayed at the right time"

"Great help with timing, especially downy mildew"

Some comments also eluded to the high-pressure 2005-2006 growing season as atypical;

"Sprayed more but this year only"

"Depends on the season"

"Sprayed more this year due to downy"

"I felt your advice urged us to spray more often this season"



Several comments were made regarding CropWatch's value to confirm those practices adopted;

"More confident in decision making"

"CropWatch makes us more aware"

"It confirms what I am doing"

"Reassurance as to my program"

"CropWatch confirms other advice"

Q: Do you agree with the comment "CropWatch is a good learning tool"?

This question received a high affirmative quantitative response, with 96% of respondents indicating 'yes', however several respondents also indicated that its educational value may be more applicable for inexperienced growers;

"For new growers – yes. For established growers – at times"

"Not really for us"

"Basically informative"

"Can be instructive for inexperienced growers"

Q: Do you agree with the comment "CropWatch does not show what is really happening in my vineyard(s)"?

Despite the Riverland's considerable breath from west-to-east and CropWatch's efforts to provide succinct information on such a large area, approximately three quarters of respondents responded that they disagreed with the comment and they felt that CropWatch did reflect the conditions in their vineyards. Several comments clarified the responses given;

"It shows what is happening in the district and makes me look at mine"

"Even if not in my vineyard, it is good to know what is around"

"The more info' the better"

"Good information to combine with your own property knowledge"

"On-site checking is essential"

"CropWatch by nature cannot be specific"

"CropWatch encourages me to go and look"

Continued next page

Q: Please provide any further feedback not covered in the survey.

There were numerous comments provided that reaffirmed some of the earlier responses, several remarks that applauded the service, however there was one issue that did receive several replies;

“Please don’t go away from faxes – I will see a fax”

“Rarely check e mail. Fax is the way to go!”

“Faxes are good because you can see them when they are there. E-mails are out of sight – out of mind”

The CropWatch team will continue to provide the service by facsimile transmission, however growers and wineries providing contributions to the Riverland Wine Industry Fund who wish to receive the service by e-mail are invited to contact PIRSA at the Loxton Research Centre on 8595 9100.

CropWatch users are reminded that the CropWatch Online website is a useful vehicle not only to access CropWatch messages, but boasts a host of other services including a comprehensive disease diagnosis tool.

CropWatch is funded through the Riverland Wine Industry Fund and managed by the RWIDC, who employs the services of Rural Solutions, The Fruit Doctors, SAMRIC, and Western Electronics. The service is working in collaboration with the River Murray Catchment Water Management NRM Board, SARDI, and the Bureau of Meteorology, while CropWatch Online is a partnership project between the RWIDC, McLaren Vale Grape, Wine, Tourism Association, and SARDI.

The Council would once again like to thank those CropWatch users who participated in the survey.

Staff Changes at RWIDC

New Industry Development Officer



The Riverland Wine Industry Development Council is pleased to announce the appointment of Mr. **Tim Smythe** as its new Industry Development Officer who began work in April.

Mr. Smythe has had over a decade of experience working in the South Australian wine industry, and comes to the industry role with viticultural qualifications from Charles Sturt University.

The Industry

Development Officer’s role includes; overseeing the CropWatch messaging service for winegrape growers, implementing a range of programs to assist growers’ understanding of efficient vineyard management approaches, and initiating research and extension in areas of regional priority.

The Industry Development Officer role is co funded between the Riverland Wine Industry Development Council and the Riverland Winegrape Growers’ Association. Both organisations draw from the Riverland Wine Industry Fund.

Part of the responsibility of the role will also be attracting research and development funding into the region. One of the strengths of the Australian wine industry has been its commitment to research and development, and through the Industry Development Officer role, this research makes its way back to the vineyards and wineries of the Riverland. Some projects include; workshops on water use efficiency including workshops tailored for multicultural groups, the development of a regional profile of the Riverland, the creation of a downy mildew action plan, and an education program to assist growers in their use of CropWatch Online.

Emily White moves to Tourism



Emily White, the Riverland Wine Industry Development Council’s Marketing and Promotions Officer for the last four years, left the organisation in June to take on the Marketing Manager’s role at the Riverland Tourism Association.

During her time at the RWIDC, Emily made enormous strides in pursuing the promotional objectives of the Riverland Wine Industry Management Plan in lifting awareness of Riverland

wine and strengthening the relationships between complementary sectors such as food and tourism.

Emily played a key role in the development of the Riverland wine DVD that was distributed last year, and has done much of the foundation work towards the Riverland Wine and Food Guide that is expected to be completed later this year. She was instrumental in also forming the Riverland Cellar Door Managers’ Group that has led to several enhancements in Riverland’s wine tourism push.

Her role at the RWIDC also included acting as the honorary secretary to the Riverland Wine Show and the Some Like it Hot seminar held annually in October. She also performed the administrative backbone function of the Council by overseeing account processing, co ordinating Cellar Door road signage for wineries, and similar important tasks.

Fittingly, Emily was the recipient of the 2006 Zonta Women’s Telstra Country Wide Young Achiever Award in recognition of her efforts to promote the Riverland wine industry.

The Council wishes Emily every success in her new job, and is pleased that she will be driving the broader awareness of region’s attractions and strengths.

Banks on Wine: Some common themes

The Riverland Wine Industry Development Council has sought the views of the major banks lending to the Australian winegrape and wine industry as to the outlook for the industry and what those working in the industry should be considering in the interim. This follows on from the forum convened by the Riverland Winegrape Growers' Association late last year where representatives of lending institutions and government discussed the financial status of the winegrape industry in the Riverland.

Common themes that the RWIDC recently garnered from the banks included;

“Know your numbers”: Almost taking on a ‘mantra status’, the banks indicated that there were “too many” growers who did not have an intimate and accurate grasp of where they were financially, and how to correctly and honestly assess their future business options – including whether exiting the industry is the most responsible course for those with high gearing and no profitable home for their grapes.

“Alternative employment”: For family-based vineyards choosing to stay in the industry, yet struggling to address loan repayments, several banks recommended that some investigation into finding an alternative income source to finance the vineyard should be considered. Given that the fallout from the depressed state of the wine market and some other industries within the Riverland, the opportunities for such work may be rarer than normal, and whether working outside the region was viable is one additional factor to consider.

“Seek professional assistance”: Again typically more relevant for family-based operations; while accountants are used to prepare taxation returns, if that is the extent of their charter and yet the vineyard business is struggling, growers were encouraged to seek professional financial assistance to plan for the future. Some banks indicated that they are approached by clients who are in an unsound financial predicament that could have years earlier taken corrective action if they had sought professional assistance in planning their financial management.

“Keep the bank informed”: Most banks have regular dialogue with their customers, but the holders of smaller loans tend not to have the level of ongoing discourse with their banks that larger customers often do. Responsible banks will try to work with their customers in difficult times, and growers are encouraged to keep the institution informed on how the business is progressing, particularly if circumstances change.

“Case-by-case view”: None of the banks that the RWIDC have had discussions with indicated that they had actively changed their policy regarding their customers in the industry with the view to offloading those loans supporting vineyards simply because the industry was in a tough time. Many went on to explain that there were too many varied circumstances and cases in the industry, that an industry-wide policy shift was inappropriate. Some also noted that the amount of information required to apply for a loan had lifted stemming from an increased level of scrutiny when assessing applications and loan restructuring.

“Difficulties to persist”: All of the banks that the RWIDC had discussions with forecast that the next two years will see little recovery of grape prices.

Recovery: One area where there was some divergence of opinion was how quickly or slowly the wine industry was likely to recover from the oversupply and successfully reposition its exports in more profitable price points. Several banks took the view that the oversupply was a cyclical phenomenon, and the industry was savvy enough to rebuild its way to meaningful recovery within three to five years. Others were of the view that; the industry and our markets have changed over the last fifteen years, with less than favourable exchange rate since 2002, in addition to the task of backfilling the debt created in the last few years plus the next few, the road to recovery could be longer than five years. The lack of confidence in national statistics relating to stock levels and vineyard area was recognised as a complicating factor in calculating the industry's health.



**Riverland
Wine Industry
Development
Council Inc.**

This newsletter was produced by the Riverland Wine Industry Development Council Incorporated. The views expressed by contributors do not necessarily reflect those of the Council.

Riverland Wine Industry Development Council Inc.
PO Box 520, Berri SA 5343
Ph **08 8582 2952** • Fax **08 8582 3309**
Email **wine@riverlandwine.net.au**
Web **www.riverlandwine.net.au**

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2005-06 RWIDC Councillors

Mr Bill Moularadellis (Chairperson)

Mr Michael Roy (Treasurer)

Mr John Angove

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Staff:

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