Redeveloping Established Vineyards to Meet Changing Market Needs

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Vineyard redevelopment—‘getting back on track’
Vineyard redevelopment is not just a case of ‘if it’s broke, fix it’. The perspective of this topic is one of taking a fresh look at current vineyard property in the light of strong international demand for wines from Australia.

Obviously, established vineyards have developed in their quality, cost effectiveness and technical sophistication over the years, but has this rate of advance been quick enough to supply the demands of the next 5–10 years? What is needed urgently to cover shortfalls in the market in the medium (3–5 year) term?

It is fair to assume that new vineyard developments, either as new sites or extensions to current sites, will primarily service the longer term market (10–20 years). To plan a major redevelopment step (like changing variety) within this 20 year term is inefficient. The suitability of these new vineyards for the actual as opposed to predicted market over this term will have considerable bearing on the impetus to rework and change variety in the next cycle of redevelopment, possibly 10 years out. I hope a sharp focus has been placed on these 10 year marketing plans (where they exist) and that they are sufficiently strong to tolerate some clever improvisation to cope with fluctuations in demand.

The international market with its strong drive for product integrity may not be as accommodating as our local market—there is obviously a tradition of Appellation d’Origine-type systems. Will the growth predominantly in varietal wines such as Chardonnay and Cabernet Sauvignon limit our potential to use surpluses or ‘stretch’ with other (sometimes lesser) blending varieties? I think it will. Hence the ability to redevelop vineyards quickly and effectively for uncompromising markets is likely to be necessary in the future.

We should have a perspective on redevelopment which says ‘we have been changing varieties, reworking others at a steady rate, now we have an opportunity to have a fresh look at our current vineyards for varietal wine production in the future’. This is opposed to sitting back and being forced into major redevelopment in reaction to future surpluses and deficits, which we failed to anticipate, or at least minimize.

It is true to say that redevelopment is currently undertaken in response to either or all of the following:
- decline in vineyard performance (health, yield, quality, and trellis)
- current industry advice on the forecast market for wine grapes
- media speculation

Other considerations should be:
- economic outlook for the vineyard
- future market projections

The success of redevelopment projects is based on their performance well into the future (5–25 years). Small steps toward achieving clear objectives are appropriate.

Evaluating market changes
Supply is currently measured in increments of tonnage by variety and district. The inadequacies of this become evident when trying to establish whether a particular vineyard is associated with the identified surplus or deficit. Vineyards producing grapes of high quality at a competitive price are always in demand, despite the fact that the district as a whole may be in surplus. Supply must include a value grading system to identify which vineyard blocks are currently or likely to be in surplus. The winemaker/purchaser needs this information to enable a thorough optimal evaluation by the grower to take place.

Current supply statistics are shown in Table 1. Note the inevitable growth based on current plantings. Note also the differences for varieties Chardonnay, Cabernet Sauvignon, Shiraz, Semillon as opposed to Crouchen, Pedro Ximenes and Riesling. Some allowance has been made for improvement in yields. (A substantial increase in new planted area from 1993

Table 1. Supply statistics projected by ABARE (tonnes) for principal wine varieties.

<table>
<thead>
<tr>
<th>Variety</th>
<th>Average 1988/89 to 1990/91 (tonnes)</th>
<th>Projected 1994/95 (tonnes)</th>
<th>Projected change (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cabernet Sauvignon</td>
<td>35525</td>
<td>61300</td>
<td>73</td>
</tr>
<tr>
<td>Chardonnay</td>
<td>36216</td>
<td>78300</td>
<td>116</td>
</tr>
<tr>
<td>Chenin Blanc</td>
<td>8617</td>
<td>17300</td>
<td>101</td>
</tr>
<tr>
<td>Colombard</td>
<td>15905</td>
<td>26000</td>
<td>63</td>
</tr>
<tr>
<td>Crouchen</td>
<td>6968</td>
<td>6200</td>
<td>-11</td>
</tr>
<tr>
<td>Doradillo</td>
<td>22728</td>
<td>18700</td>
<td>-18</td>
</tr>
<tr>
<td>Grenache</td>
<td>33240</td>
<td>29500</td>
<td>-11</td>
</tr>
<tr>
<td>Mataro</td>
<td>10087</td>
<td>9500</td>
<td>-6</td>
</tr>
<tr>
<td>Merlot</td>
<td>2936</td>
<td>7100</td>
<td>142</td>
</tr>
<tr>
<td>Muscadelle</td>
<td>4334</td>
<td>4800</td>
<td>11</td>
</tr>
<tr>
<td>Muscat, Gordo Blanco</td>
<td>75827</td>
<td>75600</td>
<td>0</td>
</tr>
<tr>
<td>Palomino</td>
<td>21257</td>
<td>17200</td>
<td>-19</td>
</tr>
<tr>
<td>Pinot Noir</td>
<td>7963</td>
<td>16000</td>
<td>101</td>
</tr>
<tr>
<td>Riesling</td>
<td>44387</td>
<td>52700</td>
<td>19</td>
</tr>
<tr>
<td>Sauvignon Blanc</td>
<td>8467</td>
<td>16900</td>
<td>100</td>
</tr>
<tr>
<td>Semillon</td>
<td>40947</td>
<td>54100</td>
<td>32</td>
</tr>
<tr>
<td>Shiraz</td>
<td>61213</td>
<td>76800</td>
<td>25</td>
</tr>
<tr>
<td>Traminer</td>
<td>7772</td>
<td>8900</td>
<td>15</td>
</tr>
<tr>
<td>Trebbiano</td>
<td>22346</td>
<td>21100</td>
<td>-6</td>
</tr>
</tbody>
</table>

Figure 1. National supply, strategic varieties
onwards will displace this curve only from 1997 onward; see Figure 1.

Vineyards not bearing, i.e. newly planted, grafted or reworked, represent approximately 10% of the national total or approximately 5,000 ha on an ongoing basis. This occurs over a period of approximately 3 years. The annual increment added to maintain this development and redevelopment amounts to little more than 3%, or 1,600 ha, and redevelopment is running at 800 ha or less than 2% of planted area. In this context it would take 50 years or more to change over our established vineyards.

Redevelopment is only significant from a short term supply aspect if it is focused on a minimum of varieties (one or two) via pricing incentives. However the rate must be maintained at higher than the current level, to avoid further ageing and rundown in cost effectiveness.

Demand projections are currently being specified in national (non district) variety tonnage requirements. The lack of regional district specifications is notable. District advisory groups are currently networking to include new districts and transfer the broad brush requirements to meaningful district information as shown in Figure 2. Individual companies will have different tonnage bias in varieties sought, but nearly all

The Penfolds Wine Group growth is confined to Chardonnay, Semillon, Cabernet Sauvignon and Shiraz. In the initial stages this requirement is predominately for commercial

The extent of growth in demand projected by ABARE falls short of that projected by industry. Many industry sources have expressed optimism at not only absorbing this apparent surplus, but also that added by an increased rate of new development in strategic varieties.

Wine style trends as indicated by current domestic sales show steady proportions of table white, red and sparkling wine in the ratios 159; 46; 28.5 kL respectively in 1992 compared with 155.5; 50; 28.5 kL previously. This gives ratios of 5.1:1:8.1:0 for 1992. The fortified and rose categories continue to fall. Table red wine in 1993 marginally improved its position on table white. Export ratios of 5:4:1 white wine:sparkling indicate a stronger bias to table wine in the international market.

In summary the market changes to be met over the next 5 years must deliver:

1. Net increased annual production equivalent to 35,000 tonnes (Premium grapes 50,000 tonne)
2. Reduction in non-strategic varieties by at least 15,000 tonnes
3. The increase should be biased to table wine end use, particularly Chardonnay, Cabernet Sauvignon, Shiraz and Semillon.
4. Sparkling wine expansion can be satisfied by new developments in cool areas.
5. Only a very small proportion of the necessary growth can come from established vineyards via redevelopment, based on current trends. If, for example, all redevelopment (approximately 2,000 ha based on 3% of total 70,000 ha) was to be to Chardonnay alone, the maximum annual increase post-1997 at 15 tonne/ha yield would be an additional 30,000 tonne/year.

Redevelopment in established vineyards can sustain little more than medium term growth in established, high value products. Redevelopment costs can be justified, however, where they effectively increase long term security of supply alone, especially for scarce winegrapes of good quality.

### Satisfying the buyer's specification

The item being purchased is winegrapes. An appropriate buyer's specification is based on: site, tonnage, minimum price, year of vintage, minimum sugar level, perhaps crop load (kg grapes per unit effective canopy area) and quality control of deliveries. A redevelopment schedule specifying replacement variety, area and a scheduled plan of action is included. An example is shown in Table 2. The contract term required is 5–10 years.

The volatile and complex changes to the wine market of the next 5–10 years must be responsibly interpreted by winemakers into a supply specification such as outlined above. Having a good supply agreement will assist in making redevelopment worthwhile for the growers but it does not ensure that the benefits will outweigh the costs; nevertheless extensive redevelopment is much more risky without one.

### Before redevelopment

Because the landholding and vineyard is already there does not mean that an ad hoc redevelopment strategy will be satisfactory. Sale of the vineyard is a definite option—just ask the bank.

### Table 2: An example of a simple redevelopment schedule

<table>
<thead>
<tr>
<th>Variety</th>
<th>Planted area to be reduced</th>
<th>Date removed</th>
<th>Replacement variety</th>
<th>Area replanted</th>
<th>First crop</th>
</tr>
</thead>
<tbody>
<tr>
<td>Doradillo</td>
<td>2.0</td>
<td>30/6/83</td>
<td>Pinot Noir</td>
<td>2.0</td>
<td>1989</td>
</tr>
<tr>
<td>Crouchen</td>
<td>1.4</td>
<td>30/6/88</td>
<td>Chardonnay</td>
<td>1.4</td>
<td>1990</td>
</tr>
<tr>
<td>Doradillo</td>
<td>1.0</td>
<td>30/6/88</td>
<td>Pinot Noir</td>
<td>1.0</td>
<td>1990</td>
</tr>
<tr>
<td>Grenache</td>
<td>0.4</td>
<td>30/6/88</td>
<td>Pinot Noir</td>
<td>0.4</td>
<td>1990</td>
</tr>
<tr>
<td>Grenache</td>
<td>0.4</td>
<td>30/6/89</td>
<td>Pinot Noir</td>
<td>0.4</td>
<td>1991</td>
</tr>
<tr>
<td>Doradillo</td>
<td>1.0</td>
<td>30/6/89</td>
<td>Pinot Noir</td>
<td>1.0</td>
<td>1991</td>
</tr>
</tbody>
</table>

Figure 2. An example of local projections Barossa Winegrape Industry Advisory Council 1995 Utilisation project items (extracts).
Unfortunately preparation for sale may be expensive, with maintenance, salvage, grubbing, burning and reseeding possibly being required on part or all of the site. Having established estimated future market requirements, other factors to consider before redevelopment are:

1. Is there a high risk from phylloxera infestation?
2. Is the likely economic life of some sub-blocks short?
3. Are there sections infected with pathogens?
4. Are there sections of poor soil and debilitated vine health?
5. Are these vines infected with virus or of inferior vegetative capacity?
6. Do these vines produce an important (high value) wine component?
7. Are the vines of known origin and true to type?
8. Can the vineyard be redeveloped to improve uniformity and manageability?
9. Do overall benefits outweigh drawbacks in this site (financial/social)?
10. Can a redevelopment proposal be financed as a separate capital expenditure item?

If the answer is ‘yes’ to most of these questions then the redevelopment option is workable subject to workforce skills and management capability.

The redevelopment program should:
1. Increase the health and economic viability of the vineyard.
2. Fit the owner’s risk management strategies.
3. Be favourable in comparison to sale or purchase of additional land.

Redevelopment checklist

The following steps are recommended:

Preliminary

Review, for the next (five year) period

1. Overall vineyard economics
   - Current ROAM: satisfactory/marginal/unsatisfactory
   - Trend ROAM: increasing/static/decreasing
   - Outlook: buoyant/static/depressed
   
   Action/options: Investigate sale for unsatisfactory options

2. Market demand
   - Variety 1
     - Current winemaker assessment: positive/non committal/negative
     - Regional demand/supply balance: short/static/surplus
     - Medium term redevelopment opportunity cost: better/no better
     
     Action/options:

3. Quality Potential
   - End-use value added: high/standard/sub standard
   - Medium term redevelopment opportunity cost: better/no better
   
   Action/options:

4. Sustainability
   - Vine health
     - Pathogens: severe/some/none
     - Capacity: increasing/steady/decline
   - Soil health
     - Pathogens: severe/some/none
     - Deficiency: severe/manageable
   - Structure: improving/sound/poor
   - Barriers: yes/no
   
   Action/options:

5. Resource allocation
   - Labour can be used to increase profitability elsewhere in the vineyard: yes/no
   - Youth is on our side: yes/possibly

   Action/options:

This type of formal review can be conducted prior to budgeting. Marginal/problem blocks should be included to define priority issues and the appropriate redevelopment option.

Post review summary

Having completed the block analysis, the following blocks form a redevelopment plan with a specified time frame.

Summary of redevelopment action required

**Example**

<table>
<thead>
<tr>
<th>Block</th>
<th>Area</th>
<th>Variety</th>
<th>Appropriate action</th>
<th>Date</th>
</tr>
</thead>
<tbody>
<tr>
<td>4</td>
<td>0.4</td>
<td>Shiraz</td>
<td>Retrellis/retrain to 2WV</td>
<td>1994/5</td>
</tr>
<tr>
<td>Moppa</td>
<td>4.0</td>
<td>Cabernet</td>
<td>Rework/retrain/install</td>
<td>1993/6</td>
</tr>
<tr>
<td></td>
<td>1.2</td>
<td>Sauv.</td>
<td>Irrigation/retrain to 1.2 m with VSP</td>
<td></td>
</tr>
</tbody>
</table>

All other blocks do not require redevelopment action over the next 5 years.

Some redevelopment objectives

1. Rationalize uneconomic areas
2. Change variety
   - replant
   - graft
3. Increase yields
   - retrellis
   - install irrigation

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* ROAM = Return on assets managed
Some options available in redevelopment

1. Root over/side/rebuild/retrellis/train/retrellis/prune
2. Prune/retrellis/train
3. Retreel/prune/retrellis/train/partial soil rebuild
4. Interplant—between vines/between rows
5. Vine row removal
6. Trellis extension
7. Tree planting or change irrigation design

Establishing a redevelopment plan

From the vineyard block analysis establish a vineyard redevelopment plan to include all necessary work. An annual review should update this against progress and finances.

With the national redevelopment area average at approximately 3% p.a., 4% p.a. should be targeted. Priorities should be established in consultation with the winemaker's specifications and commitments. In most cases the bank manager and finances will determine the rate of progress.

An annual response to the required changes is best. It can be made more secure by contracting the potential new supply to a reliable established buyer. Beware of over extending in order to "catch up".

Choosing the appropriate option

Consult local experience and seek expert advice because redevelopment is a very complex decision. As an example I have made an outline for Vinifera-Vinifera grafting, which can be used for the following situations.

1. Vineyard is to be retained.
2. Sub blocks or sections have a rogue variety, or change uneconomic block due to depressed prices to a significantly better priced option over the medium term (5–10 years), preferably with contract minimum price.
3. Stock is healthy and free from pathogens.
4. Soil is healthy and free of nematodes.
5. Soil requires minimum amelioration with phosphate, lime, gypsum or organic matter.
6. Soil drainage is good.
7. Variety has established value-adding potential in that site.
8. Grafting has been successfully trialled on that site with the same stock/scion, methods and skilled labour, or the site has shown high vegetative capacity indicating trellis enlargement/improvement is likely to be worthwhile and lead to higher yields and better quality, or previous trellis required substantial maintenance through wire replacement, T replacement, post replacement, etc.
9. Previous quality control problem existed e.g. M.O.G., low or delayed sugar development.
10. Labour and monetary resources are available in the winter and spring for training during the rapid growth cycle, or there is an opportunity to reduce wastage and cost by machine harvest, or there is an opportunity to reduce costs by mechanizing pruning on the new trellis.
11. There is an opportunity to improve the value added potential of the grapes in better products by improving the trellis and reducing canopy shoot density and crop load. Established deep root systems are valuable in dry, nematode infested areas and will lead to savings in irrigation.

The reliance on rootstocks can be minimized by Vinifera-Vinifera grafting to enable more winemaking/viticultural experience to be gained on a national scale.

Successful Vinifera/Vinifera combinations using cleft or chip bud for conversion from:
- Crouchen to Chardonnay, Semillon, Shiraz, Cabernet Sauvignon
- Riesling to Chardonnay, Semillon, Shiraz, Cabernet Sauvignon
- Pedro Ximenez to Chardonnay, Semillon, Shiraz, Cabernet Sauvignon
- Palomino to Chardonnay, Semillon, Cabernet Sauvignon
- Gewürztraminer to Chardonnay, Semillon, Shiraz
- Sylvaner to Chardonnay, Semillon

Inherent incompatibility (genetic) remains to be explained. Note also that expression of virus or viroid induced characteristics is observed in many instances. Particular care needs to be taken in choosing rootstocks for the Muscat/Muscadelle family. These varieties are also associated with the expression of irregular symptoms in the scion when used as rootstock in redevelopment projects. Cabernet Sauvignon and Chardonnay are known to do this when grafted on Muscadelle. There are reasonable grounds for avoiding grafting of the scion (including Frontignan) in redevelopment projects at this point.

Vinifera/Vinifera grafting, retaining trellis

Costs—example of components

<table>
<thead>
<tr>
<th>Description</th>
<th>Cost/ha</th>
</tr>
</thead>
<tbody>
<tr>
<td>Preparation for grafting</td>
<td>$1,400</td>
</tr>
<tr>
<td>Prune core</td>
<td>$2.200</td>
</tr>
<tr>
<td>Prunes</td>
<td>$0.700</td>
</tr>
<tr>
<td>Grafting (no regraft &gt; 95%, 2 cleft scions/vine)</td>
<td>$2.100</td>
</tr>
<tr>
<td>Grafting</td>
<td>$2.100</td>
</tr>
<tr>
<td>Repaint Pabcoat</td>
<td>$5.600</td>
</tr>
<tr>
<td>Train and desucker</td>
<td>$2.100</td>
</tr>
<tr>
<td>Trellis extension</td>
<td>$2.100</td>
</tr>
<tr>
<td>Total, less operating costs</td>
<td>$9.500</td>
</tr>
</tbody>
</table>

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Table 3. Barossa vineyard case study replanting detail 1982–92

<table>
<thead>
<tr>
<th>Year</th>
<th>Grubbed variety</th>
<th>Area (ha)</th>
<th>Replacement variety</th>
<th>Area (ha)</th>
<th>Year of replant</th>
<th>Year of full production</th>
</tr>
</thead>
<tbody>
<tr>
<td>1975</td>
<td>Semillon/Madeira</td>
<td>0.8</td>
<td>Chardonnay Mendoza</td>
<td>0.4</td>
<td>1982</td>
<td>1986</td>
</tr>
<tr>
<td>1981</td>
<td>Riesling</td>
<td>0.4</td>
<td>Riesling (Ramsey)</td>
<td>0.4</td>
<td>1981</td>
<td>1983</td>
</tr>
<tr>
<td>1982</td>
<td>Doradillo</td>
<td>3.0</td>
<td>Pinot Noir D5V12 (Ramsey)</td>
<td>0.2</td>
<td>1987</td>
<td>1989</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Pinot Noir/down roots</td>
<td>0.8</td>
<td>1987</td>
<td>1989</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Pinot Noir/down roots</td>
<td>0.7</td>
<td>1988</td>
<td>1990</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Pinot Noir/down roots</td>
<td>0.7</td>
<td>1989</td>
<td>1991</td>
</tr>
<tr>
<td>1982</td>
<td>Grenache ('52)</td>
<td>1.5</td>
<td>Zinfandel</td>
<td>0.2</td>
<td>1990</td>
<td>1993</td>
</tr>
<tr>
<td></td>
<td>Sylvaner ('76)</td>
<td>0.4</td>
<td>Shiraz</td>
<td>0.4</td>
<td>1992</td>
<td>1994</td>
</tr>
<tr>
<td>1987</td>
<td>Crouchen ('62)</td>
<td>1.4</td>
<td>Chardonnay 10V1</td>
<td>1.0</td>
<td>1988</td>
<td>1992</td>
</tr>
<tr>
<td>1991</td>
<td>White Frontignan ('70)</td>
<td>0.8</td>
<td>Chardonnay 10V1</td>
<td>0.8</td>
<td>1992</td>
<td>1995</td>
</tr>
<tr>
<td></td>
<td>Pedro ('50)</td>
<td>0.5</td>
<td>Shiraz</td>
<td>0.5</td>
<td>1993</td>
<td>1996</td>
</tr>
<tr>
<td>1992</td>
<td>Pedro ('50)</td>
<td>0.5</td>
<td>Fallow → Chardonnay</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Supply details: Contracted to PWG since 1983
Other details: 100% Supply Agreement since 1986

Redevelopment in the Barossa Valley - A Case Study

A typical example of the rate and type of change which has occurred over the last 10 years is summarized in Table 3. It indicates that even at this slow rate (2.4% p.a.) the resultant change to better varieties has increased annual income significantly by 21% p.a. In addition cost savings from increased mechanical ability at both harvest and pruning has been achieved. The redevelopment was financed on overdraft negotiated annually.

Summary

- Property: 95 ha
- Vineyard: 30 ha
- Owner/operator: Husband/wife/husband
- Vineyard details: Dualrol 60-100 cm
- Some sandier nematode-infested areas
- 520 mm mean annual rainfall
- Crop at approximately 10 tonne/ha in year 2.
- Can save approximately 40 cents/vine in preparation time by removing trellis.

Some potential problems influencing grafting success
- Non vine improvement scion wood (or next generation)
- Leaf roll
- Vine yellows and other virus/viroids
- Crown gall
- Corky bark
- Weevil
- Fuller rose weevil
- Grape vine hawk moth larvae
- Snails
- Phytophthora
- Nematodes
- Eutypa pressure
- White-ants, borers
- Muscat Gordo on Ramsey
- Breaking down of graft union with machine harvest
- Dry scion material
- Residual Chinosol
- Sealant washed off by strong sapflow
- Irregular growth
- Susceptibility to wind damage
- Loose or poor fit in cleft preparation
- Phomopsis

Redevelopment completed 0.7 ha p.a. Total 5.2 ha
1982-92 change: In price/tonne/variety mix $190/tonne
In gross income/adjusted mix $39,500 p.a. (21% p.a.)

Summary

- There are opportunities for established winegrape growers to redevelop in the short to medium term (3–5 years) depending on increased speed of redevelopment from 2% to 4% p.a.
- The demand is centred on top quality Chardonnay, Semillon, Shiraz and Cabernet Sauvignon which are strategic for varietal table wine.
- Reductions in non premium white varieties must be anticipated in proportion to the area of expansion in production.
- Crouchen, Pedro, Palomino, Doradillo and Riesling are potentially graftable.
- Every site must be evaluated on its own merits on a regular basis.
- A redevelopment review process has been proposed which will assist in formulating a redevelopment plan and increasing confidence in and quality of accelerated decision making.
- Contracts can increase the viability and lessen financial risks associated with vineyard redevelopment.
- Established winemaking districts will remain the core of premium wine development.
- Consolidation around regional variety strengths is necessary to maximize value-adding potential.
- The main viticultural threats in redevelopment are the expression of virus/viroid-like symptoms in grafting and the inexperience in optimizing flavour and character from vines grafted on rootstocks or invigorated with other modern redevelopment skills.
- Successful redevelopment can improve supply of strategic varieties in the critical period over the next five years.