

Improving the Diversity and Resilience of the Limestone Coast wine region through the use of Varieties and Clones.



Prepared by	Libby Tassie Viticulturist Tassie Viticultural Consulting
Date	November 2018

Improving the Diversity and Resilience of the Limestone Coast wine region through the use of Varieties and Clones

Summary paper of the Workshop held 31st January 2018 at Struan House, considerations from that day and more information on some varieties.

Contents

Overview	3
1. Summary of the talks and wines presented;	4
1.1. Changes, challenges and choices for the Limestone Coast region. Libby Tassie...	4
1.2. Opportunities offered with future planting material; clones and varieties. Nick Dry	4
1.3. Varietal development in the Adelaide Hills via Vine Improvement. Prue Henschke.	5
1.4. Varieties with potential for Coonawarra and Wrattenbully; viticultural aspects. Alex McKay	5
1.5. Local experiences; viticulture and marketing stories. Frank Di Giorgio & Peter Bird.	6
1.6. Varieties of the future for cool climates; where is the market headed; a wine writer & marketing perspective. Tim White	6
1.7. Vine Improvement & Limestone Coast requirements. Chris Brodie	7
1.8. Comments from Russell Fisher	7
1.9. Wines presented.....	8
2. Considerations for the Limestone Coast Region	9
2.1. How do we make those decisions?	9
2.1.1. Information on Varieties	9
2.1.2. Information on Clones	10

2.2.	Is more information needed?.....	10
2.3.	Is good planting material available?	10
3.	Varieties considered	11
3.1.	White varieties	12
3.2.	Red varieties	12
4.	Some detail for varieties	14
4.1.	Whites	14
4.1.1.	Verdicchio	14
4.2.	Reds	15
4.2.1.	Barbera	15
4.2.2.	Dolcetto	16
4.2.3.	Lagrein	17
4.2.4.	Nebbiolo	18
4.2.5.	Sangiovese	19
4.2.6.	Tannat	21
5.	Planting material sources	21
6.	References	22

This information paper follows the first document on Alternative Varieties for the Limestone Coast from 2017; “Choosing alternative grapevine varieties for the Padthaway, Mt Benson and Robe regions of the Limestone Coast”, located on the Limestone Coast website ; http://limestonecoastwine.com.au/wp-content/uploads/2017/08/Tassie_Alt-Var-Web.pdf

Overview

This document summarises the workshop “*Improving the Diversity and Resilience of the Limestone Coast wine region through the use of Varieties and Clones*”; and speakers’ presentations, wines and varieties discussed and their potential. It also looks at considerations for the region and provides additional information on some varieties that were discussed.

Speakers addressed topics around the potential for the Limestone Coast region to improve resilience by utilising a range of varieties and clones. There was consideration of the changes, challenges and potential choices facing individuals and the region, the opportunities available by use of different varieties and clonal material, and through utilising a system such as Vine Improvement. The experience with a range of varieties was presented by a number of practitioners across the growing, wine making, marketing and tasting spectrum. Examples of potential wines were presented and discussed.

Discussions during the day included the potential of where to from here, what to consider when looking at the way forward - risk taking, creating a sense of place with varieties, creating diversity via clones of the foundation varieties such as Cabernet and Shiraz, and then via alternative varieties new to the region. Is there adequate information for those decisions? Is there appropriate planting material available? Does VI need to be resurrected for the region, to better serve the regions needs, potentially also acting as a conduit to

contributing to future trials to answer some of those questions. There is the opportunity for industry to be proactive in becoming more resilient to the future challenges.

1. Summary of the talks and wines presented;

1.1. Changes, challenges and choices for the Limestone Coast region. *Libby Tassie*

Utilising a range of planting material could be a useful strategy for dealing with some of the changes and challenges in the viticultural, climatic and marketing areas. Is there good information to make the decisions of which variety is best suited to a particular site? Historically, trends in varieties have evolved, with the new alternatives making their way to mainstream; Chardonnay was an alternative variety in the 1970s.

Biosecurity is now a significant challenge with incursions of exotic pests doubling in the last seven years. Australia has few serious pests or disease issues; the control and management of which would add significant costs to propagation and vineyard costs, as in South Africa, to combat Grapevine leafroll-associated virus-3. The recent incursion of Grapevine Pinot gris Virus, GPGV, has revealed gaps in our research and development, knowledge, preparedness and management in the propagation, pest and disease sectors. The impact of GPGV varies between varieties, so a range of varieties could reduce the risk from this particular biosecurity challenge.

The impacts of climate change, involving likely warmer, more variable and extreme weather events, can be alleviated by planting a range of varieties to capture different maturity dates, spread out vintage, enable ripening under cooler conditions, lower water use with early ripening varieties and increase chances of pest, disease, heat and drought tolerance. Research has shown a varietal difference in sensitivity to wood diseases such as Eutypa, Botryosphaeria, and Esca; the last one a disease that has not yet been an issue in Australia.

To fully maximise the potential that diversity in planting material may offer, we need to have confidence that the material is true to type, pathogen free and best suited to the environment; which in turn needs more investment in the propagation sector and more investigations into potential varietal/clonal/rootstock suitability.

1.2. Opportunities offered with future planting material; clones and varieties. *Nick Dry*

With the importance of resilience and propagation material, the grapevine propagation area of the Australian wine industry needs to be valued by the industry. They do not have industry support. There are significant dollars being spent on marketing and sense of place, for example, but the base material of the industry needs to be supported.

Different clonal material within a variety can build diversity in regions that rely primarily on 1 or 2 varieties, as in Coonawarra and Wratttonbully with a predominance of Cabernet Sauvignon and Shiraz. Clonal diversity provides increased complexity from variable viticultural performance in response to different climatic conditions. There are many more choices of clones today; Yalumba plantings in the Limestone coast cover 14 clones of

Cabernet Sauvignon, with other clone by rootstock combinations, using more than 5 rootstocks, providing complexity of production.

There is the potential to build synergy with region and variety; e.g. the red variety of Tannat with possible synergy with red meat produced in the region, as it is in Uruguay. Albariño offers great potential for the Limestone coast; it makes good wine in coastal, high rainfall areas of Spain, with high sunshine hours, and also produces well in Eden Valley, with moderate yield, balanced growth and a potential range of styles. Other reds with potential are Malbec, Merlot, Cabernet franc and Tempranillo.

Varietal diversity can improve resilience against disease; Riesling has greater resistance to some pathogens, and work on disease resistant varieties is well developed in Germany, and also in Australia at CSIRO; useful to reduce reliance on fungicides. Research with Eutypa shows variable tolerance among varieties, and now possibly to the level of clones.

1.3. Varietal development in the Adelaide Hills via Vine Improvement. *Prue Henschke*

Adelaide Hills Vine Improvement Inc have been instrumental in developing a number of new varieties over the last few years in the Hills region, and in importing new clones and varieties. The Grüner Veltliner project had an initial importing and distribution role of planting material partnership with Hahndorf Hill Winery. Initial distribution was limited to the Adelaide Hills region, to a small group of growers in six sites at different altitudes. This enabled a critical mass for market exposure, aimed at the top end with an agreed "Charter of Quality"; yield no more than 3 kg/vine, 100% Adelaide Hills fruit and 100% Grüner Veltliner.

Adelaide Hills VI and a small group of growers imported the Spanish varieties Graciano, Tempranillo and Maturana Tinta; a process that can take up to 24 months in quarantine with biological and molecular testing for viruses, and pathogen testing. Rapid bulking up to more commercial quantities is possible by tissue/green cuttings both in and once out of quarantine. Costs of importation were \$6,000 per cultivar, including some bulking up.

The State Vine Improvement has a vine register that includes health status, location of mother vines, and source blocks managed by regional Vine Improvement organisations that supply the industry via nurseries. This is very important for traceback in event of an incursion as with the GPGV recent incidence. There is a need for a broader national register, held by a national statutory body.

The Adelaide Hills VI is concerned with the current state of germplasm, security of mother vines and importance of virus and virus testing. It helped to establish the Virus reference group - interested bodies from relevant industry sectors - to raise issues of viruses and testing. The next step is to see mother vines in a safe repository.

1.4. Varieties with potential for Coonawarra and Wrattobully; viticultural aspects. *Alex McKay*

This message was to proceed with caution. Take care with over investing in certain ideas, e.g. Viognier; did the expectations of creating a market match up with production? There is an opportunity for niche marketing; one producer around Lake George has had success with clever marketing, and limited quantities with only Sagrantino and Savagnin; Sagrantino is exclusively grown in Italy in an area of 10 km radius - maybe there is a reason that it hasn't gone further. A lot of Fiano is being planted around the country, with 2- 3 classes now in the Australian Alternative Varieties Wine Show (AAVWS), with its real

potential unknown. Production costs in different regions may also be an issue; e.g., Fiano is grown in the Hilltops region, at 10t/ha and good quality, at 25% less cost than is possible in Canberra.

Trends in reds are for fresh fruit driven wines. Montepulciano is doing well; Sangiovese may need a lot of work to achieve the desired quality, e.g. in one vineyard the cordon is lowered to allow greater canopy height, as in Tuscany; however, with this sort of management it only breaks even. Inclusion of other classic varietal components of Chianti with Sangiovese - Mammolo, Colorino, and Cannaiolo - illustrates the advantages of varietal diversity. Often vineyard set up is prioritised more about risk management, e.g. frost and disease pressures, than quality. The opportunity to market the vineyard, building a business brand for the property is one way of obtaining good prices. Tempranillo in Canberra, has a large canopy, but low production, (as with Smith and Hooper, Wrattobully). Differences between coastal and maritime influences may account for varietal differences in aptitude; with Cabernet Sauvignon, Canberra doesn't have the humidity to support the canopy, nor the rain to develop character. Sauvignon blanc lacks character in Canberra, and if Sauvignin is under stress, the smaller berries mean more phenolics; larger berries reduce phenolics. Cabernet Sauvignon, in Limestone coast is going very well - why change.

All varieties have their place...somewhere.

1.5. Local experiences; viticulture and marketing stories. *Frank Di Giorgio & Peter Bird.*

Frank Di Giorgio; talked of his experience with some varieties less traditional for Limestone Coast, that he works with to show the market there is something interesting and different. He tried Nebbiolo in 1990, but couldn't get it to work well for them as it did not ripen in Coonawarra. Tempranillo from the Glenroy vineyard had its first vintage in 2010, it ripens and achieves fantastic typical Rioja style wine. Montepulciano from the northern end of the region seems to work; bottled the first time in year of harvest, but he thinks Coonawarra would be too cold to ripen it. Dolcetto is made in a rosé style.

Peter Bird; 30 years in industry, has tried traditional and then other varieties to try to stand out; Viognier, Barbera, Tempranillo, Malbec; reds in 10 to 15 tonne parcels. Tempranillo appears to have settled down after 10 years, no biennial bearing, not too hard to grow. Barbera is quite yield dependent and needs green bunch thinning at veraison, then wait for acid to drop at harvest. Believes in mentoring, strength of community, helping in vineyard development.

1.6. Varieties of the future for cool climates; where is the market headed; a wine writer & marketing perspective. *Tim White*

Recommends the book by Alex McKay et al; "Italian Winegrape varieties in Australia", that considers climatic parameters with the varieties of northern Italy and central Tuscany.

What sells is king; maybe a difference between consumer and winemaker! People are open minded. Good to incorporate links with food, don't forget what the region is good at.

Sangiovese seen as a challenge; wait for good clonal planting material - as an old variety, there is a huge diversity within the variety.

Nebbiolo can produce some great wines; e.g. wine from Geographe region, Margaret River; typically, high phenolics, low anthocyanin, juiciness, perfume. Would it work in Limestone Coast somewhere? Wine from Langhe, Piedmont- Massolini, 2014.

Grenache - also known as Garnacha (Spain), Cannonau (Sardinia) - the Pinot noir of the Rhone; has a prettiness, perfume, delicacy. Pyrenees, Heathcote (Vic) produces good Grenache...would it translate to Limestone Coast? All these varieties are anthocyanically challenged - ie low colour varieties.

Comments; Grenache in Canberra, struggle with crop load, warmest vineyard still struggling (Alex McKay). In Adelaide Hills - Nebbiolo fruit quality and yield management is easier than Graciano- it needs the right spot (Prue Henschke).

Verdicchio - white variety grown in the central regions of Italy; including Marche and Abruzzo (same regions as Montepulciano).

Grüner Veltliner - Austrian white, lifted nose, beautiful - apricots, pepper, root vegetables.

Albariño - soft, round. Seen as good potential now we have the correct one.

Gewurztraminer - Hugel 2014. Spicy, complex, slightly baggy. Good variety to grow

Aromatico - white blend by Steve Pannel; varietal blends rather than straight varietals need to be remembered.

1.7. Vine Improvement & Limestone Coast requirements. *Chris Brodie*

Currently it is a time of replanting due to various reasons; wrong variety/clone/ Eutypa infection. Good to have a 20-year vineyard plan; both renewing the solid foundation of strengths, Cabernet Sauvignon and Shiraz, and to look outside the square. Where is the information and evidence on clones, varieties, or impact of rootstocks? There is a lack of good information. There is a trial here in Limestone Coast on Cabernet Sauvignon on 8 rootstocks, but that is only with one clone.

There is a strong history of Vine Improvement in Coonawarra, when Bill Brand was involved. There are still records of source blocks in Coonawarra available, and this could be the opportunity to revisit these, investigate if there is a need for Vine Improvement again in the Limestone Coast, and investigate how it could be done.

Other comments;

- Requirements for decision making; good information, trials, choices and risk taking
- Planting material - options for sources/best access, where/if Vine Improvement may fit in.

1.8. Comments from Russell Fisher

Summary of the talks; there was a theme of investment needed in the propagation area of the industry, in opportunities and mechanisms to introduce diversity via varietal and clonal material; the potential benefits; requirement to build resilience to inevitable change and disruption of the challenges; biosecurity, pest and disease challenges, climate change challenges and marketing alignment.

They looked at potentials of where to from here, what to consider when looking at way forward - risk taking, creating a sense of place with varieties, creating diversity via clones of the foundation varieties such as Cabernet Sauvignon and Shiraz, and then via alternative varieties new to the region.

To take steps to build resilience, there is a risk to change or not to change. We tend to hear things through filters; to consider change we need to open up our minds to all

options. We need to respond to the what if; resilience depends on how well prepared we are, how positioned for the change.

For the decisions, good information is needed. Is there adequate information for those decisions? Is there appropriate planting material available? Does Vine Improvement need to be resurrected for the region, to better serve the region's needs, potentially also acting as a conduit to contributing to future trials to answer some of those questions. There is the opportunity for industry to be proactive in becoming more resilient to the future challenges.

1.9. Wines presented

Sue Bell; MC and introduction. Cool climates need to look at their regional identity. Cabernet Sauvignon from Coonawarra is the foundation, and given various challenges, including climatic changes such as drought, heat, with implications such as acid retention issues, are there ways to increase the resilience of the region to cope well into the future? Clonal differences within Cabernet Sauvignon now offer more diversity than in the past. Varietal diversity is becoming a force for consideration; for example, Cabernet Franc, in the Tasmania Wine Show in the "Other variety" section, offered some delicious wines. What are the options that retain market and consumer interest, good viticultural aptitude and high quality wines?

Cabernet Franc; *Leconfield 2016*; Fashionable, hipster. In Bordeaux, the best years are when it ripens - recently it is more reliable! Can also bottle year of harvest. Very different styles possible. In Padthaway, it has been variable - now better planting material. Clones; the new ENTAV/INRA 327 from Yalumba has good potential.

Graciano; *Landine 2016*, ex Spain. Viticultural comments; a challenging variety, late to ripen, shoot and bunch thinning needed with big winged bunches, may be handpicked, destemmed, options of whole berry and stalks. Perfumed, lavender & blueberries, lighter funkier for wine bars, bottled early. The Adelaide Hills VI have 2 new clones. Further assessment on bunch structure and yield levels in the newer clones of Graciano needs to be carried out as it carries huge bunches (200-300g) and heavy crops (Prue Henschke).

Tempranillo; *Bellwether Tempranillo 2016*, ex Wrattontully. Just about no longer an alternative variety, as so much is planted nationally. This wine sells very well. Medium bodied, still get colour, can be pH/TA risk - acid drops significantly at harvest time. Some issues with biennial bearing; seems to settle as get older (Peter Bird - Wrattontully). Tempranillo bunches can be opened up and reduced in weight by pre-flowering leaf plucking of up to 5 basal leaves which results in flowerheads dropping off - usually 2 out of 3 in each small cluster (Prue Henschke).

Barbera; *Hollicks, Coonawarra. 2015*. Ripens late in Coonawarra (same day as botrytized Riesling). 15 Be, 3.2 pH, good crop, juicy, jube character. Other examples; Barbera from Beechworth, Jo Button, unoaked, and Barbera from Gundagai / Hilltops region, NSW, more continental, warm, high acid, good colour, opportunity with young oak, drink early style (Alex McKay).

Lagrein; *Wangolina 2016* from Mundulla, north end of Limestone Coast, Wirrega vineyard; gold medal in AAWVS. Rich fruit- blood plums, blackcurrant, boysenberries, savoury notes - olives and fennel with chewy tannin.

Montepulciano; *Di Giorgio 2015*. Tannin structure, off skins early, bottled early, capture fruit character. Even drank this cold from the fridge.

Lagrein and Montepulciano are both well received by marketers and consumers.

See more information in following sections 3 and 4.

2. Considerations for the Limestone Coast Region

There is a need for risk management and investment with change; risk is best managed with good information on which to base decisions. What information needs to be considered when looking at new varieties or clones?

Is this a regional issue? Is development of new varieties part of an overall plan-developing an overall suite of varieties identifiable as Limestone Coast varieties, with synergy to the region's food and sense of place.

Direction or choices of large companies may not align with smaller companies, with smaller companies possibly steam rolled. So, how do small companies do it; on their own, or are there viable options for a group or region approach as with Adelaide Hills and Grüner Veltliner?

2.1. How do we make those decisions?

Making good, informed decisions relies on getting together as much information as possible, and then consideration of risk management in that decision.

2.1.1. Information on Varieties

For greater detail of what to consider in making the planting material choice, see the document; "Choosing alternative grapevine varieties for the Padthaway, Mt Benson and Robe regions of the Limestone Coast" (Document 1). http://limestonecoastwine.com.au/wp-content/uploads/2017/08/Tassie_Alt-Var-Web.pdf

That document covers the following factors to consider when choosing a variety;

- climatic comparisons - comparing the climate where the variety traditionally grows, to the new intended regional climate
- varietal characteristics - viticultural growth, production attributes and subsequent wine potential
- varietal planting material - availability, information on trueness to type, health status and clonal performance
- wine styles required and market acceptability - will it fit expectations?

Considerations include: What is the suitability to the region; a combination of climatic suitability and viticultural characteristics. Viticulturally; is it easy to grow with good balance, or does it need significant input to enable adequate ripening, achievable in some enterprises but not necessarily all, and, is that justified by the product and potential market?

The broader picture of what is wanted from a variety; sense of place, appeal in the evolving market place, or potentially niche market, is important for the individual producer and the region to consider. Marketing considerations - will it sell, even if a good wine, it may not sell; fit with portfolio; fit in a niche market.

In this workshop, some potential varieties were considered, with thoughts from practitioners on the advantages, limitations and some requirements needed to successfully grow and produce them.

Some of the varieties discussed are included in more detail in Document 1, and some others of the less mainstream varieties have more detail included in this document in section 4.

2.1.2. Information on Clones

Differences in clonal performance are assessed in clonal selection programmes. Very old varieties, such as Pinot Noir, Nebbiolo, and Barbera have a lot of variation within the variety, and hence large clonal variation. There has been considerable clonal selection work done in Europe in the last 40 years or so, with some of the clonal selections imported into Australia; e.g. in France the ENTAV- INRA clones, in Italy the Vivai Cooperativi Rauscedo (VCR), Matura (MAT) clones and regional institute clones such as the Piedmont selections of Nebbiolo, Barbera, Dolcetto and Arneis, in Spain the ITACyL clones, and in Portugal, the Plansel clones. Information should be available for these clones, generally from the registered supplier; see list at end of document.

Clonal selection in Australia was at its peak before the 1980s, when the main parameter was yield, with quality parameters mainly ignored. A limited amount of selection work has occurred since then. Whiting (2003), summarises trials in Victoria, and supplies other references on clonal work in Australia.

2.2. Is more information needed?

There is various information available on varieties, from overseas data, and increasingly on Australian experiences; for a list of references see Document 1.

Some nurseries, such as Chalmers and Yalumba, have varietal or clonal information about their imported material, and undertake some trials.

For more information specifically for the region, is it needed, how does that happen, can the region help? There are very few official varietal or clonal trials currently in Australia.

2.3. Is good planting material available?

There has been an increase in both varietal and clonal choices in the last few years, particularly with importations from overseas.

Growers need to be aware to ask for good documentation of their planting material and buy from accredited sources. Is there confidence in the identity, the health status and the origins of the material. Is it clearly traceable?

Mainstream - Clone & Heritage material - there is some opportunity to make further selections of old or heritage material still planted in Australian regional vineyards. This would preserve some valuable and possibly unique prephylloxera material, and enhance planting material diversity.

Alternative/ emerging varieties - some material may be available through Vine Improvement and nurseries. Some newer importations may be under nonpropagation agreements, and need to be sourced from accredited nurseries.

It is important to honour these nonpropagation agreements, as the integrity of the Australian Wine industry, and valuable intercountry relationships, and future wine industry exchanges are based on mutual respect and understanding. In addition, the original and registered source has more credibility and traceability, than something "thought to be the same as...". At this stage, DNA testing cannot generally test down to clonal level; it may do so in the future.

It is important that clearly traceable, true to type and high health - ie virus free - material is a solid foundation for sustainable vineyards.

The cost of good planting material is a very small part over the life of the vineyard, and is an insurance payment for future vineyard longevity and integrity.

See section 5 for planting material sources.

3. Varieties considered

There is potential to increase diversity via use of

- clonal material in established varieties, e.g. Cabernet Sauvignon and Shiraz
- varieties less commonly planted in the region e.g. Malbec, Grenache,
- alternative or emerging varieties.

Eighteen varieties were put forward for discussion during the workshop. Details on the viticultural and oenological characteristics of some alternative and less commonly planted varieties (indicated with #) have been covered in the previous document; “Choosing alternative grapevine varieties for the Padthaway, Mt Benson and Robe regions of the Limestone Coast”.

http://limestonecoastwine.com.au/wp-content/uploads/2017/08/Tassie_Alt-Var-Web.pdf

More detail for some varieties not covered in that document is provided here in 4.3. Tempranillo is included in the mainstream here; possibly pre-emptive, but likely to be the case shortly. Inclusion of Graciano and Cabernet Franc in the mainstream maybe debatable.

Whites	Reds: mainstream	Reds: less common
Albariño #	Cabernet Franc#	Barbera
Fiano #	Cabernet Sauvignon	Dolcetto
Gewurztraminer	Graciano #	Lagrein
Grüner Veltliner#	Grenache	Montepulciano#
Verdicchio	Malbec	Nebbiolo
	Merlot	Sangiovese
	Tempranillo #	

Information on these varieties are included in the previous document ‘Choosing alternative grapevine varieties for the Padthaway, Mt Benson and Robe regions of the Limestone Coast’

Varieties developed by CSIRO that have greater pest and disease tolerance are undergoing testing; see; <https://www.wineaustralia.com/news/articles/disease-resistant-cultivars-pass-their-latest-exam> .

German and European bred varieties for pest and disease tolerance are gaining popularity in Europe, see;

<http://observatoire-cepages-resistants.fr/wp-content/uploads/2017/09/pedneault-2016.pdf>.

<https://www.piwi-international.de/en/information-en.html>.

3.1. White varieties

Five white varieties were raised as having potential. Gewurztraminer is mainstream, Albariño, Grüner Veltliner and Fiano are alternatives, but increasingly popular in the market place, and were covered in the last document. Verdicchio is less well known.

- **Albariño /Albarinho #**
 - Good potential and synergy with region; its native region in Spain, is a coastal area, and goes well with seafood. It makes high quality wine in Spain (high rainfall, and high sunshine hours) and in Eden Valley, with moderate yield, balanced growth, a potential range of styles; good potential for the Limestone coast.
 - Planting material - a number of clones now available in Australia.
- **Fiano#**
 - Increasing popularity - Fiano was at third place in the emerging varieties tonnes crushed in Australia, in 2018, (2,075t) behind Prosecco (7,081t) and Sangiovese (3,995t), just ahead of Vermentino, and grown across a range of environments. Will the market take up that production?
 - Planting material; one older clone and some new material available.
- **Gewurztraminer**
 - May have potential to pair with changing food styles. The variety Savagnin is part of the Traminer family, also known as Traminer blanc (white Traminer) and both are good growers' varieties.
 - Planting material; not a lot new in the clonal choice.
- **Grüner Veltliner#**
 - Promoted as a new regional white in the Adelaide Hills. A small amount grown elsewhere, including Canberra and Tasmania, with plantings increasing.
 - Planting material; one older clone and some new material available.
- **Verdicchio**
 - Originally from the central Italian region of the Marche, produces a crisp, fresh wine with firm acidity. Very little grown in Australia- would be a trail blazer.
 - Planting material limited in Australia; an old clone in CSIRO and SARDI collections that are still not open to the public in 2018; and one will be available at Chalmers.
 - More information see section 4.3

3.2. Red varieties

The first section of red varieties are the more mainstream varieties, with potential to utilise clonal diversity.

- **Cabernet Franc#**

- this is a trendy variety, with a niche market. It produces soft, aromatic, fruit driven wines, ripens earlier than Cabernet Sauvignon, and may need crop control, with production possibly linked to clone and site.
- comments on its potential focussed on the delicious wines; a possible advantage is that better ripening in the classic area of Bordeaux have raised the profile of this variety internationally. Some management issues had been raised previously.
- Little clonal information is available. There are some new clones available, and more coming soon.
- **Cabernet Sauvignon**
 - this variety is the backbone and flagship for Coonawarra; some options with different clonal material could increase diversity and complexity.
 - a number of clones are now available, with noted clonal differences in some newer ENTAV- INRA clones from Yalumba eg 412, 338. Further potential for selection of old “heritage “clones in the Limestone Coast region.
- **Graciano#**
 - this late ripening variety, known primarily in the Rioja, Spain, produces highly coloured, perfumed - lavender and blueberry - well structured wines. A Graciano from McLaren Vale (Samuel’s Gorge) has just won the best Iberian Wine in the 2018 AAVWS
 - comments; late to ripen, crop levels can be a challenge, both shoot and bunch thinning may be required, retains acidity, can use old oak and bottle early to make lighter, funky style for wine bars.
- **Grenache**
 - Garnacha in Spain, Cannonau in Sardegna, Grenache can make a range of styles, and has been making a comeback alone and in blends as a lighter, elegant style, perfumed, with red fruits, cherries, spice and herb notes.
 - Comments - potential in cooler climates, e.g. Dogrock in the Pyrenees produces two examples of the variety- as lighter-bodied, elegant, more fragrant than those from warmer climates.
- **Malbec**
 - from France (known as Cot) but more widely grown in Argentina, it typically produces robust dark purple wines with plum, blueberry, vanilla notes and soft velvety tannins. In Australia, plantings and exports have recently increased, with some recent good wines from cooler climates. It has midseason budburst and maturity, with possible yield issues seemingly clone dependent.
 - Clonal options are being explored in Langhorne Creek; see following reference.
 - <https://www.langhornecreek.com/wp-content/uploads/2018/11/Malbec-for-the-Australian-Wine-Industry-Project-Report-FINAL.pdf>
 - New imports include 6 Italian Matura clones imported by Chalmers, and 2 others by Vine Improvement.
- **Merlot**

- Well known, with the advantage of early ripening, there is an increased excitement around Merlot. It is a natural pairing with Cabernet Sauvignon, seems a good fit for the region.
- Some new clonal material increases options.
- **Tempranillo#**
 - There is so much interest in this variety in Australia, it may soon become mainstream. Plantings in cooler climates are exciting, with a closer climatic affinity to some Spanish regions of origin; continental and high diurnal temperature differences. It is planted and producing good fruit in northern parts of the Limestone Coast, Mundulla and Wrattenbully.
 - Yalumba established a trial with 8 Tempranillo clones, including newly imported ITACYL and ENTAV-INRA® clones, at Eden Valley in 2011. Results from the 2018 trial show interesting differences. New clones also from Adelaide Hills Vine Improvement. Tempranillo from Wrattenbully is being acknowledged by trade and the market place.

More information on varieties less known; more detail see section 4.2

- **Barbera**- Red variety from the Piedmont region in Northern Italy. Some grown in Limestone Coast, Coonawarra; Hollicks; ripens very late.
- **Dolcetto**- lighter style that may benefit from the current trend to lighter, fruit driven tastes.
- **Lagrein** - potentially versatile red from northern Italy, now planted across a number of different climatic regions in Australia.
- **Montepulciano #** - Wine styles range from rosé through to complex premium wines capable of ageing. Getting some success in Australia, recognition by trade and consumers. Always sells well in cellar door (Frank di Giorgio). It is grown in Mundulla, ripens very late, 3- 4 weeks after Shiraz, so maybe a challenge for cooler Coonawarra.
- **Nebbiolo**- a challenging variety: seems to be very demanding of site - hard to ripen adequately, and get the flavour development. Can make beautiful wine.
- **Sangiovese** - also challenging; more demanding than Shiraz or Cabernet Sauvignon. Greater clonal choice now may improve the success of this variety.
- **Tannat** - promising as potential synergy with regional produce of beef.

4. Some detail for varieties

4.1. Whites

4.1.1. Verdicchio

This white variety is very widely grown in Italy in the central Marche region and in the northern Veneto region, under the name Trebbiano di Soave, where it combines with the variety Garganega to make Soave. Other synonyms include Trebbiano di Lugana and Trebbiano Valtenesi, and it is identical to Peverella, a white variety from the northern region of Trentino. It is the major component of the DOC wines Verdicchio dei Castelli Di Jesi and Verdicchio di Matelica. There is a little planted in Brazil (20ha), as Peverella.

The wines are fresh, with firm acid and citrus, white fruit and almond characters. The old practice of skin contact is now rarely used, and there are also some sparkling styles made. It is not widely planted in Australia, so there is very little local information. Chalmers have some new material.

Planting in the Limestone coast would be a trailblazing exercise.

Verdicchio	Information
VITICULTURE	
Phenology	Mid-late season budburst, and mid-late season harvest.
Growth	Vigorous with good yields, and according to the VCR document, long pruning is preferred, but that is not confirmed in Australia.
Susceptibility	Italians report susceptibility to botrytis, and powdery, but that may be a function of its place of origin.
Soil and climatic preferences	Reported to need a site to allow for sufficient ripening; that may also be a function of cropping levels.
Harvest factors	Bunches medium, compact or semi compact with medium, yellow - green berries. Delicate berries also reported.
WINE	Gives wines of good structure and acidity, yellow, straw colour, delicate perfume and fresh, citrus, almonds, herbs and hazelnuts.
PLANTING MATERIAL	Possibly available as Peverella IF it really is Peverella. Old material Verdicchio at CSIRO but that is closed to the industry. New material from Chalmers.

4.2. Reds

4.2.1. Barbera

Barbera comes from the continental Piedmont region in northern Italy, and is the third most grown variety in Italy after Sangiovese and Trebbiano Toscana. It is widely grown in California (7,000 ha), and there are 800 ha in Argentina. In Australia, 100 hectares are distributed across regions, from warm, continental Riverina, to cooler regions including King Valley, Clare Valley, McLaren Vale, Adelaide Hills and Central ranges.

Comments from workshop in Limestone Coast; ripens late. In Coonawarra a small parcel is grown, ripens very late- same time as botrytized Riesling. Barbera from Beechworth, Jo Button, unoaked, has done well. In Gundagai / Hilltops region, more continental, warm, high acid, good colour, opportunity with young oak, drink early style. At Wrattenbully it requires some crop control to ensure ripening, and waiting for the acid to drop at harvest.

As a very old variety, there is large diversity within the variety, so significant differences between clones. The potential for the Limestone coast lies in the ability to manage the acidity and ripen adequately in a cool region.

Barbera	Information
VITICULTURE	
Phenology	Mid-season budburst, after Shiraz, and mid-season harvest - generally before Cabernet Sauvignon, after Shiraz, depending on region
Growth	Medium - high vigour, depending on clone. As with Nebbiolo, growth is long and spindly- different to typical French varieties. Good yields; can be excess crop, and require control - shoot / bunch thinning - to avoid compromising quality. Good basal bud fruitfulness, both cane and spur pruning in Australia. Shoot thinning also helps to establish spur positions (Peter Bird, Wrattenbully).
Susceptibility	Variable, but generally good against botrytis, dependent on bunch compactness that varies with clone. Generally good against other diseases. Reported susceptible to heat stress.
Soil and climatic preferences	Good colour and acidity allow good production in warmer climates. It is grown across a wide range of environments, but acid and yield need management in cooler climates.
Harvest factors	Bunches variable with clone- small, medium to large, (or can be very large) with medium to large berries. Yield control may be necessary, bunch thinning once or twice a season; green bunch thinning at veraison to eliminate later bunches, (Wrattenbully, Peter Bird). Yield range reported in Australia from 6 - 12 t/ha in the moderate and cooler regions. Fruit has high natural acid, and often there is a need to wait for acid to drop at harvest. It has moderate tannins and good, deep ruby colour, descriptors of cherry, blueberry to blackberry, black cherry as it ripens.
WINE	Wine styles can range from light and fruit driven, even slightly frizzante in Piedmont, to the bigger, oaked wines with ageing potential. Typically, they have high acid, good colour, fleshy fruit and savoury tannins, with savoury, leather characters.
PLANTING MATERIAL	In the National Register (2006). Older clones from California, 1980s clones from Piedmont, and Chalmers clones imported in the late 1990s.

4.2.2. Dolcetto

Dolcetto is from the Piedmont region in Northern Italy, known for lighter wine styles, soft, round and ruby red. An example from Bests, Great Western, produces wines with “lifted aromas of perfumed cherry, anise and savoury herbs... juicy black cherry flavours with fine powdery tannins and a savoury finish” (<https://www.bestswines.com/dolcetto>).

It was produced at Bests under the name of Malbeck for many years, before its true identity was resolved. It is grown in a range of regions in Australia including Great

Western, Hunter, Barossa and King Valley, Adelaide Hills and McLaren Vale. Early ripening, light style potential could be an advantage for cooler climates of Limestone Coast. Italian reference says it is demanding and requires the correct environment. Proven success at Great Western, grown at Mundulla/Bordertown and fits with move to lighter styles of wine.

Dolcetto	Information
VITICULTURE	
Phenology	Mid-season budburst, and early to mid-season harvest - may be after Shiraz.
Growth	Low to medium vigour. Good basal bud fruitfulness, spur pruning fine.
Susceptibility	Generally good against botrytis, with a loose bunch, but can be susceptible to berry shatter, although may also carry excess crop that impacts on quality. Italian reports of shatter when environment unsuitable. Yield manipulation may be required to prevent overcropping. Possibly frost susceptible, reports of downy susceptibility.
Soil and climatic preferences	In Piedmont evidently good results on loamy and calcareous soils (Mannini, 1997). Planted in Australia across a range of sites.
Harvest factors	Reports of bunch stalk desiccation, thin skins and berry shatter. May need hand picking.
WINE	Wines are light to medium bodied, good colour- crimson more than purple- soft to moderate tannins, fruity and fragrant- with almond notes.
PLANTING MATERIAL	In the National Register (2006); some clonal material from Piedmont in 1980s, more recently from Chalmers.

4.2.3. Lagrein

Lagrein is grown in the Trentino-Alto Adige region of northern Italy. It produces two styles of wine; a lighter rose style, or heavier medium to full bodied red, often blended with the variety Schiava Grosso.

It is also grown in California, and across a range of regions in Australia, from warm Riverland to cooler climates, with early notable success from warm regions and now, *Wangolina 2016* from the Mundulla, Wirrega vineyard won a gold medal in AAWVS.

Good colour and tannin reminiscent of Shiraz may entice Shiraz, or Shiraz /Cabernet drinkers to this variety. It is well received by trade and consumers. At Mundulla it tends to ripen about the same time as Shiraz (Jeff Flint pers comm), and appears to be relatively versatile.

Lagrein	Information
VITICULTURE	
Phenology	Mid-season to late budburst, or, earlier in cool climate, and late harvest - about same as Cabernet Sauvignon, or same as Shiraz (Mundulla).
Growth	Medium - high vigour. Mix of pruning, cane and spur seems fine. Sacrificial canes are left to manage vigour at Mt Crawford.
Susceptibility	Variable reports against mildews, good against botrytis, dependent on the bunch compactness that varies with clone; crop thinning may be required. Poor fruit set may follow poor weather conditions.
Soil and climatic preferences	Grown in a relatively small area in Italy, and now in a range of regions in Australia, also producing good wines in warmer regions.
Harvest factors	Bunch ranges from compact, to semi compact to low compactness. In cooler climates, harvest may depend on waiting until green/herbal characters soften and more fruit characters develop; green characters not common with the wines.
WINE	Wines have a notable vibrancy, colour and tannin with cherry, mulberry, blackberry & plum notes. It can show new oak influence quite strongly; need to manage to avoid dominant oak influence.
PLANTING MATERIAL	Two old UCD clones available.

4.2.4. Nebbiolo

Nebbiolo is among the most ancient of varieties, and possibly the most distinguished variety in Italy grown in the continental north west, noted primarily in Piedmont. It produces three main wine styles; Barolo, Barbaresco and Nebbiolo - differentiated by their places of cultivation, or DOCG zones, and time of ageing in wood- three, two or one year respectively, and thus indicative of complexity and ageing potential. It is a very exigent variety - demanding of place - with very early budburst and late maturity, and requires very attuned attention in both the viticulture and winemaking, if indeed it is growing in the appropriate place.

Being so old, there is significant variation between clones, and recent DNA work suggests more variation than clonal in fact, with the subgroup of Nebbiolo Rosé being ascribed as a different variety, with a parent-offspring connection.

There are variable reports of success with Nebbiolo; with reports of some people in various regions of Australia having tried this variety, but in the end pulling out the vines. Recent successes from the Adelaide Hills, King Valley and others, including Hilltops region, are encouraging.

Nebbiolo	Information
VITICULTURE	
Phenology	Very early budburst, and late-season harvest - after Cabernet Sauvignon. In Coonawarra, it evidently had budburst in July!
Growth	Low to medium to high vigour. This is a variety that definitely has low basal bud fruitfulness, and <i>has</i> to have cane pruning in most regions (Rutherglen evidently has success with spurs). It also, like Barbera, has very thin, spindly long growth - internodes and shoots - compared to many other varieties, and needs adequate supportive trellis and training. Yield management is required.
Susceptibility	Nebbiolo is reportedly susceptible to powdery, and variably to botrytis depending on clone.
Soil and climatic preferences	Grown in a range of soils in north east Italy, mostly on the most optimal exposed hillsides for adequate ripening, with its environment is reflected in the wine. As with Burgundy, the top areas in Piedmont have been delineated into Crus. Piedmont is very continental, so MJT values are misleading if looking at homoclimes purely with that measure.
Harvest factors	Bunches vary from medium to large, with clonal variation. Ripeness is late, picking reported between 12.5 and 14.5 or 15 Baumé, when fruit and tannins developed.
WINE	Wines classically have floral and savoury notes “tar and roses” - rose petals, violets, raspberries with tobacco, tar and leather.
PLANTING MATERIAL	Older material from UCD, clones imported in 1989 from Piedmont - CVT CN 111 and 230, and more recent imports by Chalmers.

4.2.5. Sangiovese

This is an old variety widespread through central Italy, in Tuscany and the Emilia - Romagna regions, and known under a number of synonyms; e.g. Nielluccio in Corsica and Brunello di Montalcino in Montalcino, Tuscany. It is often the major part of a blend, and is

now planted more extensively through the country, in the south and on the islands of Sicily and Sardegna.

There are large plantings of Sangiovese in Argentina and California; Californian declined from a peak of 1,214 ha in 2003 to 789 ha in 2010. In Australia, Coriole and Montrose were among the first wineries to plant and experiment with Sangiovese in the 1980s, and discovered that it can't be grown like Shiraz and Cabernet Sauvignon, requiring more attention in the vineyard. It is now planted across diverse regions in Australia; in 2008 there were 517 ha, and 3,995 tonnes were produced in 2018. The quality of the wines seems to be rising, and there is also an interest for rosé style wines.

A varietal misidentification was discovered in Western Australia, in 2001, where some supposed Sangiovese was discovered to be Carnelian.

There is a huge diversity between clones, with both morphological and physiological characteristics.

There were 35 clones registered in Italy in 1997, across several biotypes. Clonal material in Australia was very limited until the late 1990s, when more clones were imported, with planting options now greatly increased.

Sangiovese	Information
VITICULTURE	
Phenology	Similar phenology to Shiraz, moderate to slightly late ripening; impacted by propensity of some clones to yield very well.
Growth	Medium to high vigour, moderate to high yield that may need extensive management; single bud spurs often used to contain crop, that can still sit at about 20t/ha in Wrattenbully where it goes into a Rose wine. Shoot thinning as well as bunch thinning appears to be quite a common necessity. Leaf thinning is also mentioned.
Susceptibility	Possible sensitivity to Botrytis.
Soil and climatic preferences	Grown in many different environments. Prefers low vigour sites according to one Italian reference (VCR).
Harvest factors	Crop control necessary to get fruit ripe at reasonable yield levels; excess crop leads to lower colour - anthocyanin levels.
WINE	A very versatile variety, with high quality potential, it can produce a range of wines; rosé, novello, light, medium to full bodied style. Classic Chianti relies on other varieties for more colour, and recent blends include Cabernet Sauvignon, in both Italy and Australia. Typified by floral, fruit - plum , cherry , savoury and spice characters with firm acidity and tannin.
PLANTING MATERIAL	In the National Register (2006); some more clones from 1990s.

4.2.6. Tannat

This variety comes from south west France, Hautes Pyrenees region, and is now widely grown in Uruguay, where it is also known as Harriague, and to a lesser extent in Argentina and Brazil. It produces rich, full bodied wines, with high tannin and colour, often in blends with Cabernet Sauvignon, Fer and Cabernet franc.

It is planted across a number of regions in Australia. In Uruguay it is known for its synergy with the beef production of that country; and was raised in this forum under the potential for good pairing with the Limestone Coast beef production.

Tannat	Information
VITICULTURE	
Phenology	Variable reports of budburst - early to late budburst - with late maturity, after Shiraz, maybe similar to Cabernet Sauvignon depending on region.
Growth	Vigourous, average bud fertility, cane pruned in France but spur pruning has been fine in Australia. Bunches are large, often compact with small to medium size berries.
Susceptibility	French reports susceptibility to disease, but Australian reports have been generally good against disease, with good tolerance to heat.
Soil and climatic preferences	Planted across several regions in Australia, and on different soil types in Uruguay, with relatively high rainfall sites.
Harvest factors	Needs to be ripe, with tannins softened, acids dropped and flavours developed, possibly at high sugar levels.
WINE	Wines of solid structure, high tannin, colour and acid; winemaking to soften tannins may be utilised. Typified by red fruits, cherry, raspberry, plum, spice and currant characters with good ageing potential.
PLANTING MATERIAL	In the National Register (2006).

5. Planting material sources

Imports carried out by Nurseries and Vine Improvement organisations in the last 20 years or so have greatly expanded the range of varieties and clones available. Chalmers Nursery brought a lot of material in from Italy, Yalumba Nursery from France and some Vine Improvement Organisations from a number of different countries. Other nurseries have

imported various material, possibly not in the numbers that Chalmers and Yalumba have done.

It is important to retain the credibility of the Australian wine industry, and our good relations with other countries, by honouring the non-propagation agreements, and purchasing material with clear traceability where possible.

The following is a short list for contacts. Other nurseries may also carry other clones.

An introductory list for planting material contacts (not exhaustive).

Vine improvement (VI) organisations

- Australia Vine Improvement Association (AVIA) <http://www.avia.org.au/> National Nuclear Collection, Dareton Agricultural Research and Advisory Station, Dareton, Vic
- Adelaide Hills Vine Improvement Inc. (AHVII) <http://adelaidehillsvineimprovement.org>
- Barossa Vine Improvement, also known as the Barossa Grapegrowers' Vine Selection Society Inc (BGVSS), <http://www.barossa.com/barossa-vine-improvement>
- Langhorne Creek Vine Improvement Committee http://www.langhorne_creek.com/the-association/vine-improvement-committee/
- Riverland Vine Improvement Committee Inc. (RVIC) <http://www.rvic.org.au/> Cirami Block, Harding Road, Monash SA 5342
- The South Australian State Vine Improvement organisation, currently known as Australian Grapevine Foundation Planting Service (AGPFS) (Formerly SAVI and SAVII) <http://www.agfps.org.au/varieties/> also located at Monash; the registered supplier of Plansel clones from Portugal.
- Victoria and Murray Valley Vine Improvement (VAMVVIA) <http://vamvvvia.org/>

Nurseries with some alternative varieties (others can also provide a number of alternatives).

- Chalmers Nursery <http://www.chalmersnurseries.com>; registered supplier of Italian clones from Vivai Cooperativi Rauscedo (VCR), Matura (MAT) clones
- Yalumba Nursery <http://www.yalumbanursery.com>; registered supplier of INRA/ENTAV clones from France.

6. References

References and further reading

Anon., 2009. Varietal Report; Barbera believers dedicated to variety's potential. Australian Viticulture. Jan/Feb. p 73- 81.

Anon., 2009. Varietal Report; Barbera considered the great lady of red varieties. Julia Conchie *et al.* Wine Industry Journal. May/June p 70- 79.

Anon., 2015. Varietal Report; Bringing Lagrein to Life. Wine and Viticulture Journal. July/ August. p 75- 78.

Anon., 2006. Varietal Report; Nebbiolo. Joel Pizzini *et al.* Wine Industry Journal. July/ August. p 70- 82.

Anon., 2007. Varietal Report; Sangiovese -climatically suited to Australia and increasingly popular with consumers. Mark Lloyd *et al.* Australian Viticulture. Sept/Oct. p 74- 82.

Anon., 2015. Varietal Report; Tannat- both Beast and Gentleman. Shane Harris & Peter Dry. Wine and Viticulture Journal. March /April. p 61-62.

Australian Alternative Varieties Wine Show, www.aavws.com.

Bests wines. <https://www.bestswines.com/dolcetto>; accessed 20/11/18

Day, R. (2009) Lagrein - an Italian engine, relaxed in a new Aussie home. Aust NZ Wine Industry J. 24(3):13-15

Robinson, J., Harding J., and Vouillamoz, J. (2012) Wine Grapes. A complete guide to 1,368 vine varieties, including their origins and flavours. Allen Lane, Penguin Books. London.

Mannini, F., Calo., A. and Intrieri. C (1997) Italian Viticulture: Focus on High Quality Native Wine Cultivars and their Growing Areas. Aust. NZ Wine Industry J. 12 (4): pp 408 - 421

Petrie, P. R. (Ed) (2010) Think global plant local - alternative varieties. Proceedings of a seminar. Mildura, Vic, 5 November 2010, ASVO and Australian Alternative Varieties Wine Show.

Nicholas, P. (ed). (2006) National Register of Grapevine Varieties and Clones. AVIA, Irymple, Australia.

Robinson, J., Harding J., and Vouillamoz, J. (2012) Wine Grapes. A complete guide to 1,368 vine varieties, including their origins and flavours. Allen Lane, Penguin Books. London.

Tassie, L., Dry, P., and Essling, M. (2010) Alternative varieties: emerging options for a changing environment. AWRI Research to Practice 142 pp. (many of the articles referenced are cited in this document)

Vinefinders, www.vinefinders.com.au

Vinodiversity, www.vinodiversity.com

Vitis Rauscedo http://www.vivairauscedo.com/pdf/catalogo_italiano.pdf accessed 23/11/18

Whiting J. (2003). Selection of Grapevine Rootstocks and Clones for Greater Victoria. DPI., GWRDC. Melbourne, Vic.

Winecompanion, www.winecompanion.com.au

Acknowledgements

Thanks to the Limestone Coast project subcommittee for organisation of the workshop and for their help with this document; James Freckleton, Sue Bell and Chris Brodie.

Thanks to those people who presented and participated in the workshop held in Struan House, in particular Nick Dry, Prue Henschke, Alex McKay, Tim White, Frank Di Giorgio, Peter Bird, Chris Brodie and Russell Fisher.