ELTHAM AND DISTRICT WINEMAKERS GUILD

ESTABLISHED 1969

SEPTEMBER 2021

The Guild encourages the responsible consumption of alcohol

The Guild meets on the last Friday of each month *(except December)*

**** * ~~at the Eltham Living & Learning Centre~~ * ****

… + ONLINE via Zoom …

8 pm start

Next meeting: Friday 24th September, 2021

Guests who are interested in finding out more about the Guild are welcome to attend any of our regular Guild meetings

In This Newsletter:



President's Press

EDWG 2021 Annual General Meeting

Our AGM was be held at the August Guild Night and, while there were no new committee members appointed, I would like to thank *Richard Martignetti* for nominating as Vice President. You should start to hear more from Richard now.

September Guild Night

This month our Wine Show Chief Judge, *Sandrine Gimon*, will be talking about the blending of red wines, why and how. In normal times we might have a practical demonstration and get to sample some interesting blends, but not this year. At least we can engage in some healthy discussion and maybe sip and contemplate one of our own blends.

Eltham Wine Show 2021

You should now be planning your entries for the show, making any adjustments and even making some more wine. The *Jo Illian* trophy this year is for the best berry wine (including mead), and you could easily have a finished berry wine ready by the show date! Please see Mario's *Wine Show Director's Report* later in the newsletter.

Introduction to Winemaking Course

By the time you read this we will have presented the final session of this course. Presenting this course via Zoom has been an interesting experience, quite different to previous workshops. Running a course or workshop this way has many advantages: we save the cost of hiring a venue, don't have to move 'stuff' from home to the venue and can reach participants almost anywhere. I'm hoping to get plenty of feedback from the participants of this course to enable us to improve the experience for future courses.

Samepage Replacement

As most of you know we will be replacing *Samepage*, the Guild's forum system. After conducting trials of several competing products, the Committee have selected the replacement – **SLACK** - an interesting name which reflects how we all feel from time to time! *Slack* has more features and seems more intuitive than *Samepage*. The transition to *Slack* will take place at the end of September while *Samepage* will remain in place until December - as a reference only.

Cheers,

Wayne Harridge – President

2021 Committee & Committee Meeting Dates

President	Wayne Harridge	**Newsletter**	Angela Harridge
Vice President	Richard Martignetti	**General**	Danny Cappellani
Secretary	Mario Anders	**Committee**	Trevor Sleep
Treasurer	Mario Anders		Graham Scott
Assistant Treasurer	Bill Bussau		Angela Harridge
Past President	Mario Fantin		Trevor Roberts
Wine Show Chief Judge	Sandrine Gimon		Glen van Neuren
Wine Show Director	Mario Fantin		
Webmaster	Mario Anders		

Members elected to positions on the Guild Management Committee meet every month. Meetings alternate between General Guild and Wine Show business.

Guild Business Meetings

Agenda: Guild Night Program, Membership, Winemaking Education Initiatives, Social Events, Financial, Website, Guild Promotion.
Meeting Dates (Wednesdays): December 8

Wine Show Meetings

Agenda: Marketing, Logistics, Sponsorship, IT, Judging, Financial, Governance
Committee Members plus Sandrine Gimon (Chief Judge) attend these meetings.
Meeting Dates (Wednesdays): October 13, November 10

Visitors Welcome

Members are welcome to attend committee meetings as visitors. New ideas and suggestions for improvement are most welcome. If you would like to attend, please contact the President or Secretary.

Forward Program for Guild Events

Guild Nights will continue via ZOOM for the foreseeable future.
Social Activities & Workshops will take place according to COVID guidelines.
We will keep you updated as to what we are able to do via Samepage and the Website
… so keep …

*More information to come *

DATE	ACTIVITY
Saturday September 18th 2pm	**Introduction to Winemaking: Session 4** ZOOM* Tasting and Finalising
Friday September 24th *	**Monthly Guild Night:** *Eltham LLC + ZOOM* ***Red Wine Blending*** – our Chief Wine Judge Sandrine Gimon will take us through the blending of red wines. ***What's going on in the winery ATM?*** General chat about the tasks, problems, tips, and ideas at this time of the year. ***Tasting:*** *Red Blends* Bring along your *Red Blends* to share.
End of September	**Online Forum Move from Samepage Slack**
Wed. October 6th	**Chat @ 8!** ZOOM* Informal chance for members to hop onto ZOOM and chat about wine matters – on ZOOM @ 8pm
October 16th & 17th *	**Nillumbik Open Cellars: Spring 2021** Take a drive through the beautiful hills and visit some of Victoria's finest boutique wineries. Check the Facebook page for more details as they become available.
Sunday October 17th *	**Nillumbik Open Cellars Spring Lunch @ 12.30** Choose your own Open Cellars to visit, then meet up at a Winery (TBA) for lunch and info sharing. We'll decide on a cellar to meet at as soon as the list is available – keep an eye on Samepage.
Saturday October 23rd	**Eltham Wine Show:** Closing Date for Entries

Friday October 29th * 	**Monthly Guild Night:** *Eltham LLC + ZOOM* ***Judging Berry Wines*** – judges Wayne Hewitt and Anne Shea will discuss what the judges look for in Berry Wines … the 2021 Jo Illian. ***What's going on in the winery ATM?*** General chat about the tasks, problems, tips, and ideas at this time of the year. ***Tasting:*** *Berry Wines* Bring along your *Berry Wines* to share.
Wednesday November 3rd	**Chat @ 8!** ZOOM* Informal chance for members to hop onto ZOOM and chat about wine matters – on ZOOM @ 8pm
Friday November 12th	**Eltham Wine Show:** Final delivery date for entries
Saturday November 20th *	**Eltham Wine Show:** Judging Day
Sunday November 21st *	**Eltham Wine Show:** Public Open Day
Sunday November 21st *	**Dinner @ Veneto** We deserve to not have to cook dinner tonight!
Friday November 26th * 	**Monthly Guild Night:** *Eltham LLC + ZOOM* ***Wine Show Review*** – the Final meeting of the year & Chief Judge's review of the 2021 Wine Show. ***What's going on in the winery ATM?*** General chat about the tasks, problems, tips, and ideas at this time of the year. ***Tasting:*** *EDWG Wine Show Medal Wines* Bring along your wines that won a *Medal* to share.

Other Dates for Your Diary

DATE	ACTIVITY
Friday October 1st	**Frankston & South Eastern Wine Show:** Final delivery date for labelled bottles
Saturday October 9th	**Frankston & South Eastern Wine Show:** Judging Day

Wine Show Director – Update

Mario Fantin

Eltham Wine Show Getting Very Close Now

The closing date for entries is 23rd October, which is not very far away. By the time you receive the next newsletter entries will have closed, so I will briefly outline below what you should be doing now:

1. Start giving some serious thought to the wines you will be entering in the Eltham Show.

    - You should enter all your current vintage wines.
      This most likely will be the first time your wines have been looked at by professional judges, so it is good that you will receive some feedback while the winemaking techniques you used are still fresh in your mind.
      What we are looking for are any faults which can still be rectified, particularly if the wines that have not been bottled yet. Give some thought to entering blended wines in the show. Carry out some blending trials to see if your base wines can be improved. Remember you can legally add up to 15% of wine from another vintage or wine of another variety without having to declare it on the label. You will be surprised how your wines can be improved by blending, professional winemakers are always blending their wines.

    - Consider entering your wines from previous vintages to see how they are tracking.
      Wine continues to evolve and change in the bottle. Each wine will reach its peak in quality at a different point in time, often years after first being made. Not only are you looking for wines that are at their peak at the moment, but you are also looking for wines which have already peaked and are on the decline. If you can resist the temptation, in the ideal world, you should be drinking your wines when they are at their peak (easier said than done!).

2. Remind your winemaking friends about the due date for entering wines in the Eltham Show.
   This is very important as it is easy for people to become complacent in the unusual times we are currently living in. Give your winemaking friends a friendly reminder to enter and outline the benefits they will receive. We have a great team of professional judges lined up who are ready and eager to provide constructive feedback.

3. Download the entry forms now from our website and have them in a prominent place so you don't forget to enter on time.

Country Winemaking Challenges

I have said in previous newsletters that we should all be having a go at making country wines at some point in time. This is an exciting field of winemaking which has many advantages. These wines can be made all year round in small quantities, with readily available ingredients and utensils. The wines can be quite flavoursome, and a perfect accompaniment with certain food and dishes. In this article I wanted to touch on country wines which can be a challenge to make, and probably should be avoided when first starting out.

With a country wine we should be able to identify the fruit the wine was made from in a blind tasting. The notes below are from a chat I had with *Diego (Danny) Cappellani*, one of our leading country winemakers in the guild.

- ***Blackberry and Strawberry Wines***
  Because of their flesh composition, it is very difficult to maintain the original fruit flavours of these berry wines over time. They often start very well and look very promising, but quickly fade away. It should be noted that it is not difficult to make wine from all berries. For example, it is almost impossible to make a raspberry wine which cannot be identified in a blind tasting.

- ***Citrus Fruit Wines (Orange, Mandarin, Grapefruit)***
  The trap people fall into is using slices of fruit to make the wine. It is important to exclude the pith so only use the juice and rind, which can be a time consuming and tricky task. Including the pith will add bitterness to the wine.

- ***Rose Petal Wine***
  This is a wine we don't come across very often these days. Because of the weight of rose petals you need, it is necessary to accumulate the petals over time and keep them in the deep freezer until the desired quantity is obtained.
  Hints from *Danny* include:
  - Only pick petals that smell strong on the bush (some have poor or no fragrance).
  - Pick petals at the end of that single flower's life - when petals are almost ready to fall (quoting Harry Gillam) - early to mid-season in the flowering season
  - Pick in the early morning as soon as petals are dry.

You can make very nice country wines with the ingredients noted above, despite the challenges. The wines need to be made with very careful attention to detail. Often there will be lots of trial and error until you determine what works best to achieve the right outcome for your taste preference.

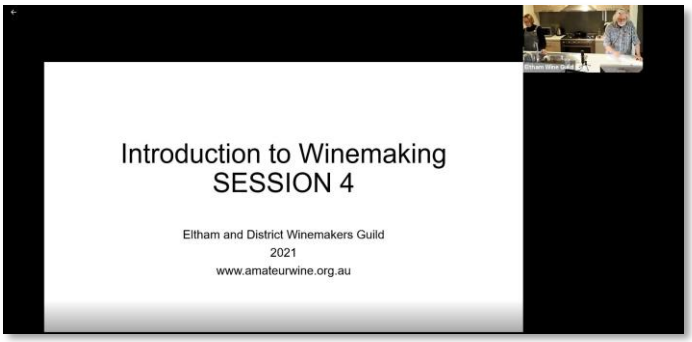
Introduction to Winemaking Course

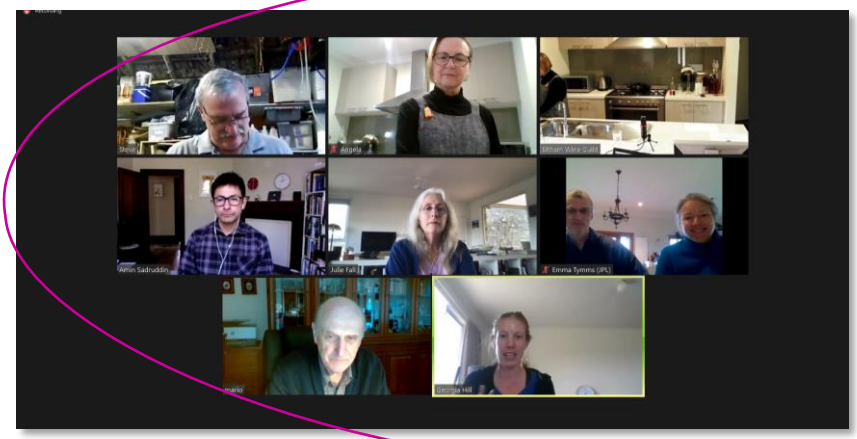
Our first online (*ZOOM) course has had its last session.

While we still have much to learn about presenting an online course – we made our way through 4 sessions … and now have a bunch of new winemakers waiting for the day where they can bottle their first batch of raspberry wine … and are ready to try out their skills on something new.

Session 4

The final session covered preparing wine for bottling …
… adjusting the wine
– additions
– acid trial
– fining
… stabilizing
… bottling



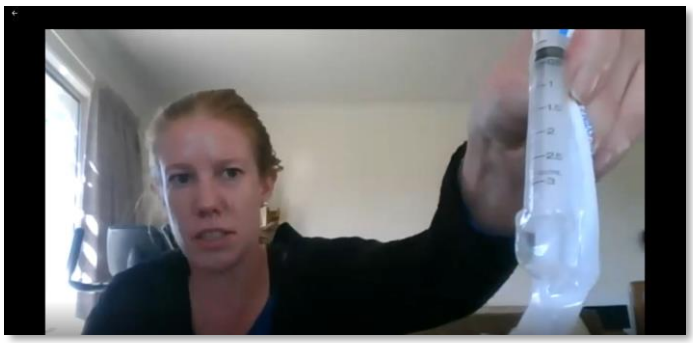


… a general chat about how our wines were going, any problems we'd encountered and questions …

… share time …

How to do an acid trial …
… measuring and mixing the acid

… what can be used to measure each dose



… and the taste test

The only thing missing is being able to get together to taste each other's wines.

We finished the sessions with a chat about the pros and cons of online learning – and, while we all agree that being able to meet face-to-face is great – presenting the course online has enabled people from regional Victoria and Interstate to join in and learn how to make wine … and THAT makes it all worthwhile.

So … keep an eye out for future online courses … we promise there are more to come!

➢ An Introduction to Winemaking participant and a Guild member and (with overlapping 5km zones) did a rhubarb:country wine bottle swap … here's the ***Rhubarb 'Champagne'*** recipe that's now being made …

2L boiling water
10L cold water
3 whole lemons sliced finely (remove pips)
1.2kg rhubarb chopped small
320ml white wine vinegar or cider vinegar
1.6kg sugar (I recommend that the amount of sugar be reduced to taste if you don't like very sweet drinks)

Red Rhubarb = Pink Champagne
Green Rhubarb = White Champagne

- Put sugar into a clean (sanitised) plastic 5L jug pour, over boiling water and dissolve sugar.
- Add cool water to the 5L mark.
- Put rhubarb and lemon into sanitised fermenter.
- Pour over the sugar solution, add another 5L of the cool water and lastly add vinegar and stir well.
- Cover the fermenter with a breathable cloth and leave 48 hours, no longer, or the rhubarb will sour.
- Strain, pour into bottles and cap.
- Leave for 2 weeks (it will build up gas pressure after only a couple of days).
- Makes approximately 12L of champagne.

NOTE:

- This beverage is non-alcoholic or only slightly alcoholic according to the source website.
- I generally use just under half the sugar recommended.
- I strain the champagne into a demijohn and then use a syphon to transfer to the bottles.
- Use PET soft drink bottles or STRONG Champagne bottles, as it is possible that high gas pressure will build up in the bottles.
- If you are concerned about explosions, make sure that you use PET bottles with screw caps. It may be prudent to store the bottles away from carpeted areas or store them outside (remember Grandpa's exploding ginger beer?).
- Storing bottles in the fridge, once ready to drink, will reduce the explosion potential and will ensure that the 'champagne' is chilled and ready to drink.
- This is an old 'traditional' recipe – I'm not sure how the fizz is generated; but believe me, it works really well.
- This recipe can be adapted to use raspberries, lemons on their own, or other ingredients such as elderflower.
- The champagne will store for quite some time if left in a cool and dark area. It lasts longer on the glass champagne bottles.

Did You Know …?

Daniel Pambianchi: *Quiz time!*

Who is Daniel Pambianchi?

Daniel Pambianchi is a well-known winemaking author, lecturer and consultant, and seasoned winemaker, both as an amateur and professional, having owned and operated a small commercial winery in Niagara Wine Country in Ontario, Canada. His bestselling book Techniques in Home Winemaking has become the go-to reference textbook by advanced amateurs and small-winery operators alike. He has also authored a newly released tome, Modern Home Winemaking, which will become a popular reference and guide for anyone wanting to take their winemaking to new levels. His area of expertise is wine chemistry in which he performs extensive studies in his wine analysis lab. He is a member of the American Society for Enology and Viticulture, the Australian Society of Viticulture and Oenology, and the American Wine Society.

The Question!

Would two wines fermented to the same final SG/Brix have the same amount of residual sugar?
Please explain your answer.

The Answer!

LONG RESPONSE BUT I WANTED MY ANSWER TO BE INFORMATIVE TO HIGHLIGHT CERTAIN RISKS

The intent of the quiz and the way it was worded was to highlight a risky assumption that some winemakers make, that two wines with the same final SG have the same amount of residual sugars (RS). There are online calculators and formulae that convert final SG (or Brix) into a RS amount with no consideration for other parameters. Two wines with the same final SG can have significantly different amounts of RS and risks of refermentation.

SG (and Brix, Baumé, Oechsle, Balling, etc) measures density. Measurements made with a hydrometer are approximate as they are affected by alcohol, acidity, and many, many other wine components. For all practical purposes, they are good approximations, but not for determining RS. And standard hydrometers are not accurate. A reading of 0.995, which is commonly used to determine end of fermentation and dryness, can easily be off by one point and even 2, i.e. it can be 0.996 or 0.997, and so it can have significant amounts of sugar and cause refermentation. Personally, I use a high-accuracy hydrometer to assess end of fermentation and dryness.

Yes, alcohol (% ABV) affects SG readings and the amount of RS. Many of you mentioned OG (Original Gravity). That too is a factor but keep in mind that two wines with different OG can ferment to the same final SG and same final %ABV as different yeasts metabolize sugars differently. Of measurable parameters, acidity too affects RS. All this too say that estimating final RS is very complicated, with different methods yielding very different results, and that therefore the only recommended method to determine RS is to measure it.

The type of sugars (glucose vs fructose) in the final wine is not a factor in this context, but yes, two wines with the same RS can taste differently – one may taste sweeter depending on the proportion of sugars.

Why is this all important?

Consider that a white wine with 12.5% ABV and a final SG of 0.995 can have as much as 8 g/L of RS, which clearly puts the wine at high risk of refermenting. Ditto for a red wine with 13.7% ABV (initial SG 1.110) and a TA of 5.0 g/L, which can have as much as 7 g/L RS.

Winemakers often use a threshold of 4 or 5 g/L (0.4 or 0.5%) to determine if a wine is stable and that it will not referment. I use 2/gL to be safer.

And now you see why the above white and red wines are at high risk of refermenting. Sure, if you bottle the wines with sufficient SO2 and drink them relatively quick, it's a moot discussion, but the longer you age the wines, the greater the risk. I have seen many wines at 0.995 or 0.996 start refermenting after 6 months in the bottle.
To minimize such risks if you intend to age wine, and especially if you don't use SO2, ferment to as close to 0.990. Otherwise, where sterile filtration (to remove yeast) is not possible, it is recommended to add sorbate (when possible, ie not in wines that have undergone malolactic fermentation) in conjunction with SO2.

Vince Conserva

Malolactic Fermentation in Wine

Magali Bou [and others], *Malolactic Fermentation in Wine*, 2005, Lallemand, Montréal, Canada
(full document) https://bit.ly/3sFEYd4

In this excerpt from the technical binder "Malolactic Fermentation in Wine" (Lallemand, 2005) written for commercial winemakers, researchers at Lallemand, Inc. offer an insider's view of the more technical aspects of malolactic fermentation (MLF).

Lactic acid bacteria (LAB) are natural inhabitants of vineyards and wineries. These bacteria can transform malic acid into lactic acid. Wild LAB may not completely degrade all the malic acid in wine must and may additionally produce off aromas or flavors. However, specially selected strains of LAB, such as certain strains *Oenococcus Oeni*, are the desired microorganisms for performing a successful malolactic fermentation.

Lactic acid bacteria (LAB) are found naturally on grapes, leaves, soil and equipment surfaces and have the ability to grow on a variety of sources, including grape juice. The most common LAB belong to the genera *Lactobacillus, Pediococcus, Leuconostoc* and *Oenococcus*. These bacteria are generally microaerophillic (they respire anaerobically, but are stimulated by small amounts of oxygen), require carbohydrates and must be supplied with amino acids and vitamins in order to proliferate. Wild or cultured LAB may cause a malolactic fermentation in wine. Knowing the factors that affect the viability and health of LAB will enable winemakers to stimulate or inhibit their action, according to their winemaking plans.

Typically, LAB identified in grape musts are present at approximately 104 cells per mL. The majority of these bacteria are not tolerant towards the changing environmental conditions associated with winemaking and disappear during alcoholic fermentation. However, many species are able to survive, in particular *Oenococcus oeni*, which is often found in wines with a pH below 3.5. Wines exhibiting a pH greater than 3.5 are capable of supporting a broader range of species.

Regardless of the species of LAB, the main significance of these organisms in wine production is their ability to conduct malolactic fermentation (MLF). MLF is characterized as the degradation of L-malic acid to L-lactic acid and CO2, a process which decreases the amount of acidity in the wine. However, MLF not only represents a biological deacidification process, it also exerts a significant impact on the organoleptic aspects of wine. These sensory effects can be positive or negative, depending on the bacterial species or the strain of LAB employed to conduct the MLF. LAB strains that produce particularly favorable characteristics in wine, and hence are more desirable to perform the MLF, are often termed "malolactic bacteria" (MLB). LAB strains that negatively influence the final product may cause a range of undesirable changes to wine sensory properties, altered wine color and may even lead to the generation of biogenic amines.

Microorganisms, MLF and Wine

Given the important role of the organism employed for MLF, it is an increasingly common practice to inoculate a fermentation with a known malolactic bacterial strain or a mixture of strains, rather than depend on the naturally occurring flora. The advantage of inoculating is that the time and the extent to which MLF occurs can be controlled and the quality of the final product can be predicted. Species of *Lactobacillus* or *Pediococcus* may conduct MLF, especially in wine exhibiting a pH higher than 3.5, but usually result in non-acceptable wines. These genera are poorly tolerant to low pH and produce undesirable flavors as well as high levels of acetic acid.

Enter *Oenococcus oeni*

Despite the potential of many LAB for use in wine production, *Oenococcus oeni* remains the organism of choice for many wine producers. *Oenococcus oeni*, the bacteria formerly known as *Leuconostoc oenos*, is a facultative anaerobe (It can respire anaerobically or aerobically). It's nutritional requirements are complex.

A source of carbon (derived from sugars), nitrogen (derived from free amino acids or short peptides), vitamins (nicotinic acid, thiamine, biotin and pantothenic acid), mineral ions (Mn2+, Mg2+, K+ and Na+) and purine derivatives (guanine, adenine, xanthine and uracil) are all required for optimum growth. *Oenococcus oeni* cells are spherical and occur in chains when grown on solid media. Growth is generally slow and can take from 5 to 7 days to form visible colonies at incubation temperatures between 68–86 °F (20–30 °C).

Although previously grouped with the *Leuconostoc* species, DNA analysis of *Oenococcus oeni* strains has placed them in a group that is clearly distinguishable from the *Leuconostoc* species. It is widely believed that *Oenococcus oeni* represents the best candidate to conduct MLF because of its resistance to a variety of environmental stresses, in particular the acidic conditions and the high alcohol levels which are typical of wine. Inoculating wine with carefully selected strains of *Oenococcus oeni* has the advantage of enabling the winemaker to have more control over MLF. In addition, employing a specific strain of *Oenococcus oeni* allows the winemaker to ensure that particular characteristics are produced in the final product, thus creating wines that are more distinctive and characteristic.

Although a single bacterial strain is generally employed, in some instances a mixture of strains may be used in the inoculum. This procedure can not only produce certain preferred characteristics in the wine, but is also capable of maximizing the chances of bacterial survival if a bacteriophage (a virus that targets bacteria) is encountered in the wine.

Interactions with Yeast

Although some strains of yeast are capable of contributing to MLF, the role of yeast is generally negative, given its main function of converting nutrients to ethanol. The inhibitory effect of certain yeast strains on MLF has been reported and is generally caused by the production of yeast metabolites that can have a negative influence on bacteria as well as competition for nutrients. Interestingly, studies of the growth patterns of yeast and bacteria on agar plates performed in the Lallemand laboratories and elsewhere have indicated that some yeast strains may actively inhibit the growth of *Oenococcus oeni* by the production of an "antimicrobial" substance (or substances). Such data supports the belief that the relationship between yeast and bacteria is complex and matching the appropriate strains of both is the key to successful MLF. The autolytic activity of wine yeast during aging on lees can greatly affect the concentrations of nitrogenous compounds available to malolactic bacteria, including amino acids, peptides. It has been suggested that leaving wine on yeast lees specifically to maintain a higher level of carbon dioxide (CO_2) may further encourage MLF.

In wine, sulfur dioxide (SO_2) exists in a pH-dependent equilibrium between bound SO_2, molecular or free SO_2 and bisulfite and sulfite ions. Low levels of SO_2 can inhibit the growth of LAB in wine, resulting in stuck malolactic fermentation, and high levels of SO_2 can kill bacterial cells. Molecular SO_2 is considered to be the most toxic form for LAB and it has been reported that a molecular SO_2 concentration as low as 0.1–.15 mg/L may be inhibitory to the growth of some strains.

Although SO_2 concentrations are dependent on the chemistry of the wine, they may also be influenced by the yeast strain used to conduct the alcoholic fermentation. Some yeast strains are capable of producing rather

large amounts of SO2. If MLF is required, it is important to use a yeast strain that produces little, if any, SO2.

Factors Affecting LAB
The composition of the wine, the method of vinification and the interrelationships between LAB and other microorganisms present can affect the survival and growth of LAB in wine and therefore influence MLF. Environmental conditions such as pH, temperature, alcohol level, nutritional status and levels of sulfur dioxide (SO2) may also play a significant role.

A pH Around 3.4
A critical parameter for successful MLF is pH, and the minimum pH at which bacterial growth can occur in wine is approximately 2.9–3.0. Bacterial growth is faster and MLF is completed earlier as the pH increases above 3.0. Although a pH of 6.3 is optimum for the activity of the malolactic enzyme, degradation of malic acid by non-growing cells of *Oenococcus oeni* is most rapid at lower pH values due to an increase in intracellular pH to 4.0. It is widely accepted that in terms of initiation and completion of MLF, a pH of approximately 3.4 is the most desirable.

Under 15% Alcohol
Alcohol tolerance is an important characteristic of many LAB, and resistance to alcohol varies among them. Most strains are not capable of proliferating in wines with an ethanol concentration greater than 15%, but some have been observed to grow in the presence of 20% ethanol.

Some Like It Hot
The optimum growth temperature for LAB is between 77 and 95 °F (25–35 °C) and the rate of malate degradation by non-growing cells is highest at approximately the same temperatures. The rate of growth of malolactic bacteria and the speed of the MLF are inhibited by low temperatures. This can be problematic, particularly during the production of white wines, which tend to be fermented at lower temperatures.

Carbohydrates Required
Growth conditions during the malolactic fermentation (MLF) in wine are very difficult for LAB. During the malolactic fermentation, 0.4–0.8 g/L of sugar is degraded, the bulk of which is represented by glucose and fructose, which are the most important sources of energy for bacterial growth. Nearly all wines contain adequate amounts of these sugars to sustain sufficient bacterial growth to ensure a complete MLF, but it has been shown that the MLF may be inhibited in wines in which the sum of the concentrations of glucose and fructose is less than 0.2 g/L. *Oenococcus oeni* is heterofermentative (utilizes more than one fermentation pathway) and converts glucose to L-lactic acid, CO2 and acetic acid (or ethanol). Almost all strains of malolactic bacteria ferment glucose and fructose, with most preferring fructose.

Nutrients Are Nice
If yeast with high nutrient demands conduct the alcoholic fermentation, the juice is rapidly depleted of factors necessary to support the growth of LAB. Under this condition, a bacterial nutrient must be added. Similarly, the addition of a bacterial nutrient is critical in juices with naturally low nutrient levels because some yeast may produce excessive levels of SO2, which will strongly inhibit the MLB. Suffice it to say that proper nutrition of both yeast and MLB is always essential. Under the difficult pH, SO2, alcohol and nitrogen conditions found in wine, the use of supplemental nutrients will make it possible for *Oenococcus oeni* to survive and multiply. Careful preparation of malolactic (ML) starter cultures and proper use of the nutrient preparations designed for those cultures will ensure the rapid start of the MLF. Although malic acid is the most important acid metabolized by LAB in wine, other organic acids are also metabolized.

Tartaric acid Small decreases in the concentration of tartaric acid are sometimes observed during the MLF. These changes are most likely due to changes in the solubility of tartaric acid rather than to actual microbial degradation. The degradation of tartaric acid is always associated with wine spoilage.

Malic acid Tartaric and malic acids are the two major organic acids in wine, especially in wines from cool climates. Malic acid is naturally present in the L- form. D-malic acid is not naturally present in grape juice and is

not metabolized by wine LAB. Several studies have shown that L-malic acid stimulates growth and biomass production of Oenococcus oeni. During growth at low pH, MLB degrade malic acid at a high rate, whereas carbohydrate is degraded at a low rate. This phenomenon results in an overall increase in pH, which, in itself, allows for an increase in carbohydrate utilization, thus explaining the observation of malic acid induced growth.

Citric acid Citric acid is a major compound in grape must and wine and can be found in concentrations ranging from 0.1 to 0.7 g/L. Citric acid metabolism by *Oenococcus oeni* has been correlated with the synthesis of acetic acid, diacetyl and acetoin. *Oenococcus oeni* is not able to grow on citric acid as a sole carbon and energy source, but in the presence of an energy source such as glucose, the growth rate of *Oenococcus oeni* is enhanced. Citric acid is completely metabolized in some wines, but to a lesser extent in others. Production of diacetyl and acetoin by *Oenococcus oeni* is stimulated by increased citric acid concentrations and the maximum concentration of diacetyl is found upon completion of malic acid degradation. During the MLF, degradation of citric acid is delayed as compared to the degradation of malic acid.

Winery Practices

Clarification of juice and wine not only can physically remove a large portion of LAB, it can reduce the amount of bacterial growth obtainable, thus impacting wine quality. In addition, clarification will remove nutrients and suspended particles stimulatory to bacterial growth, further impacting the MLF.

Timing of the inoculation of MLB will also influence the kinetics of MLF. The availability of nutrients will be affected by interactions among wine microorganisms. It is common to expect that mixed cultures of microorganisms will introduce the possibility of antagonistic and synergistic relationships but, in some minor cases, they exert little or no influence over each other. In winemaking, there is always the possibility of interactions occurring among LAB and yeast, fungi, acetic acid bacteria and even bacteriophage. Moreover, there also may be interactions among different species and strains of LAB. The antagonistic effect of yeast on MLB has been explained through competition for nutrients and the production of substances that inhibit bacterial growth, such as SO2 or medium-chain length fatty acids. Conversely, yeast may support the growth of LAB in wine and stimulate the progress of MLF. During the process of yeast autolysis, vitamins and amino acids are released into wine, and the associated extended lees contact enriches the wine with micronutrients that stimulate MLF.

Interaction of Factors

The best understood factors governing successful MLF include SO2, pH, alcohol and temperature. For the MLF to be successful, the values of these chemical parameters must correspond to those which allow the bacterial cultures to function successfully. It is important to remember that these factors function synergistically, i.e., their actions together have a greater total effect than the sum of their individual actions. Similarly, a favorable level of one component may compensate for an unfavorable level of one or several of the other components. Although assigning exact values to each component is difficult, abiding by the parameters as defined by the different producers of commercial cultures is imperative. Adherence to this rule is perhaps the most important consideration to ensure successful MLF. In some cases, it can be very difficult to produce a wine whose analyses conform to these general parameters. Red wines from the New World that are harvested at very high maturity and with subsequent high alcohol levels are a typical example. In these cases it is important to select the proper yeast strain to produce the wine, as well as the correct bacterial strain to conduct the MLF. Even when all chemical factors fall within the desired parameters, the course of MLF will occasionally be problematic. Possible causes of these anomalies will be discussed below.

Lesser-Known Factors

A number of lesser-known factors can influence the course of MLF. The fact that they are lesser known does not mean that their impact is less significant. These factors include the following:

Tannins Recent research has shown that certain grape tannins can have a negative influence on malolactic bacteria, and consequently on the course of MLF. In fact, some research has indicated that certain red cultivars, such as Merlot, can have great difficulty undergoing a successful MLF. Latest results at Lallemand indicate that phenolic acids influence the growth of certain bacterial strains in laboratory growth media. The effect on

growth stimulation can be either positive or negative, depending on the bacterial species, the specific phenolic acid used and its concentration. A nutrient to support the course of MLF under these limiting circumstances might be considered.

Lees compaction As a result of hydrostatic pressure, the lees found at the bottom of a tank can be compacted to such an extent that yeast, bacteria and nutrients are "captured" and cannot function properly. It has recently been observed that larger tank sizes may correlate with increasing delays in the initiation of the MLF. The inhibition of the start of the MLF in larger tanks can be overcome by pumping over either on the day of inoculation or on the second day after inoculation with the bacteria. A general recommendation would be to stir the lees regularly (at least weekly) to ensure that bacteria and nutrients are kept in suspension. Of course, these observations were made at commercial wineries. At home, the size of your fermenter is not likely to be large enough to begin to inhibit the action of LAB.

Residual lysozyme activity If lysozyme is used during the production of wine, residual levels of this enzyme may impact the time required for the onset of MLF. Care must be taken to follow the supplier's recommendations with regard to the required time between the addition of lysozyme and the inoculation of the commercial MLF culture. In most cases, racking the wine off of the gross lees is recommended.

Excessive amounts of oxygen Malolactic bacteria have been shown to be sensitive to excessive amounts of oxygen. This means that exposure of the bacteria to undue amounts of oxygen after the completion of alcoholic fermentation should be avoided. Although it has been noted that even low concentrations of oxygen may detrimentally influence MLF, micro-oxygenation may have a positive effect on MLF due to the gentle stirring action associated with the micro-oxygenation process itself.

Fungicide residues Certain fungicide and pesticide residues, especially the former, may have a detrimental effect on the functioning of malolactic bacteria. Most effective, in a negative sense, are residues of the systemic compounds often used in humid years to control the *Botrytis* fungus. Careful precautions should be taken in years with high incidence of *Botrytis* contamination. Wine producers must be familiar with the spraying programs and products used, and they must adhere to the prescribed withholding periods required for the various antifungal products.

Initial malic acid concentration Malic acid concentrations differ among grape musts. As such, the duration of an MLF may differ from one year to the next. It is especially difficult to induce an MLF in wines with malic acid levels below 0.8 g/L. In this case, using ML starter cultures with a high malate permease activity is recommended.

Fatty acids Sufficient levels of oleic acid are necessary for malolacic bacteria to reach and maintain high cell viability in the wine. In fact, the success of MLF is influenced by the ability of the bacterial strain to assimilate oleic acid. Certain practices, such as must clarification, can lead to a wine deficient in oleic acid. If the MLF was induced using very high cell numbers, this phenomenon may not be observed. Medium-chain length fatty acids can have a negative impact on the course of MLF. The antagonism between yeast and lactic acid bacteria could be explained by the production of certain medium-chain length fatty acids.

This knowledge of the biology of malolactic bacteria should allow you to encourage or inhibit MLF, as your winemaking plan dictates.

The authors of this binder excerpt are yeast researchers at Lallemand, Inc.

Diego (Danny) Cappellani

The **EDWG** Committee, in its wisdom, decided that we should offer at least one Country Wine recipe in every newsletter. I drew the shortest stick. The plan is to offer recipes pertinent to the time of the year when fruit, berries, flowers and herbs might be plentiful in your garden, your neighbour's garden or in the bush.

This month we will take on **Roses** (any colour) and **Elderberry flowers.**

Roses are only weeks away, so you need to start planning.
The recipe is for 2 litres, but you can make more if you like, just do your maths with the ingredients.

Some recommendations for the process of picking rose petals**:**

- It is important to only pick roses with the best possible fragrances.
- Pick them in the early morning, but make sure they are dry.
- The best smelling roses are always early in the season.

~

Elderberry Flowers are about one month or so away from now.
The supply can be scarce in some areas. I am told that they grow wild in the *Golden Triangle* (Daylesford-Maryborough- Maldon). Unfortunately, COVID 19 rules may not allow us to travel that far. There are more Elderberry trees around than one might think. Keep your eyes open, your neighbour might have one.

It's important to pick the flowers as soon as ready, as if they stay on the plant they will brown and loose fragrance.

Final recommendations:

- Removing the flower from the sprays is tedious, but well worth it in the end.
  Use scissors, a fork or just rub one spray against the other.
- You need to be sure you do not include any stalks, as they will add bitterness to your wine.
- The same applies for the lemon pith, that too is a wine spoiler.
- Please leave some flowers on the tree to give you a *berry harvest* – so you can make red Elderberry wine.
- Elderberries make delightful red wine, and we will deal with that later in the year.

Good luck and remember – we make our luck.

ROSE PETAL WINE

2 Litres …

½ litre container of petals
3 ripe bananas (for body and mouthfeel) or
1g pectic enzymes
3g champagne yeast (EC 1118)
1.75 litres hot water
450g white sugar
100g raisins
Juice of 1 lemon or 1 orange
Yeast nutrients (Nutriferm or just DAP)

1. Pick roses early in morning, but only the ones with high perfume and keep them cool until use.
2. If using raisins instead, chop and soak overnight in equal weight of hot water.
3. Put petals in container. Add sugar and pour hot water over them. Stir. Allow to cool.
4. When cool, add pectic enzymes, bananas and lemon/orange juice. Stir daily and keep cool in fridge. As the ferment diminishes, top up with water gradually to achieve correct ullage.
5. On fourth day, drain and discard petals. Put liquid in a 3 litre plus container. Hydrate yeast and add to liquid. Add nutrients.
   The ferment should be visibly active. Install and airlock.
   Ferment under cool conditions if possible. This will harness all the rose perfume.
6. When ferment stops, drain from sediments and add 50 ppm (minimum) of SO_2. Allow to stand for one month, rack again and if clear, bottle, adding 20 ppm in the process.
   Mature for 3 months minimum.

ELDERBERRY FLOWER WINE RECIPE … ANGEL WINE

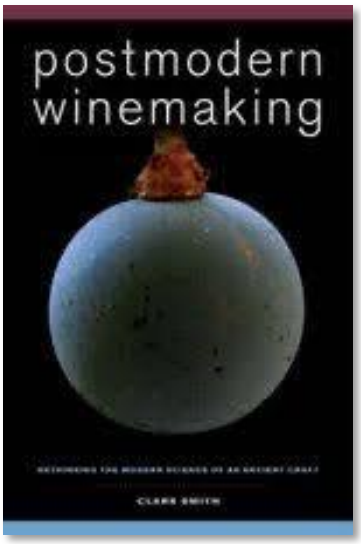
5 litres …

8 to 10 sprays of fully opened and fragrant flowers
Juice and zest of 4 medium-sized lemons (no pith, as it adds bitterness)
800 g white sugar
5g champagne yeast
4.5 litres of water
2g pectic enzymes
2g yeast nutrients or DAP

1. Remove flowers from sprays (clusters) using a fork or scissors, but avoiding any stems, as they will also add bitterness to the wine.
2. Put the carefully removed flowers, lemon zest (not juice) and sugar in a food-safe container that can lidded. Keep lemon juice for later.
3. Boil 3 litres of water (possibly filtered and chlorine-free, if possible) and pour over flowers, sugar and zest. Stir and allow to cool.
4. When cool, add enzymes, cover and put in fridge for 4 days, lightly stirring.
5. On fifth day, strain fluid from flowers into a fermenting container, adding lemon juice and remaining 1.5 litres of water. Add hydrated yeast and yeast nutrients. As ferment diminishes, top up ullage with water.
6. When ferment ends, rack and add minimum of 50 ppm of SO_2. Rack again in one month and a third time at 3 months, then bottle.
   Mature for at least 4 months before drinking. Then, ENJOY!

Richard Webb: *Micro-oxygenation*

My attempt at micro-oxygenation, MOX for short, is finally looking promising. But I'll begin at the beginning.



This year I bought a new winemaking book *Postmodern Winemaking* by Clark Smith. He was involved in selling MOX systems in the USA. While I have some reservations about much of the content, I found his theoretical description of MOX to be understandable[1]. Also, he gave enough practical details that I was encouraged to try it at home.

The plan was, according to Smith, MOX after yeast fermentation but before Malolactic Fermentation (Malo, MLF)[2]. This was the *best time* to do it - the wine at this stage having an 'astonishing appetite for oxygen[3]' and at an accommodating temperature of 14-16C. It is advisable not to conduct MOX outside of this temperature range as, given the wine hasn't completed Maloand is yet to get any SO_2, the risk of spoilage is increased. Then, if more MOX is needed after Malo, do it again while recognising that the wine's thirst for oxygen may be only about 1/10 of what it was pre-Malo.

This Vintage I was fortunate to get some really nice Yarra Shiraz. It had good fruit and abundant, if somewhat unpleasant, tannin. The tannin was *green* according to Smith's taste descriptions. MOX is supposed to *melt* this green tannin, amongst other things. My first attempt to follow Smith's instructions and attempt to MOX this Shiraz immediately post primary fermentation was early April, when I had a stable 15-16C temperature in the cellar. Unfortunately, the temperature dropped after a few days – the onset of Winter – so I had to abandon the attempt. Aquarium heaters don't work at temperatures below 20C.

So, I moved the wine to proper closed storage, heated it to 20C and added the malolactic bacteria. While waiting for Malo to finish I continued researching MOX and found that you can buy an Oxygenation kit for beer making. Then I realised that it was designed to provide high-rate oxygenation not micro-oxygenation[4]. It is a good bit of kit, but I could not turn it down to the merest trickle of oxygen needed for MOX.

Further research turned up in a PhD paper[5] that discussed, amongst other things, active and passive micro-oxygenation. The active version uses equipment (that I don't have). Passive MOX happens in wooden barrels and also polyethylene flextanks. I don't have a barrel the right size, nor a flextank, but I do have several 20-litre polyethylene plastic jerrycans. They have only ever been used for juice and wine. Then I noticed that two cupboards in the house were maintaining a steady15^{o}C through winter and they were big enough (and empty enough) for said jerrycans. So, when Malo finished, I sulphured and racked some Shiraz into jerrycans. There was also

1 Postmodern Winemaking, Clark Smith, p31-57.
2 Ibid, p50
3 Ibid, p93
4 Beer wort loses oxygen when it is boiled so it needs oxygenation before the yeast is pitched.
5 https://www.icwm.co.za/download/89/downloadable-dissertations/860/2009-blaauw-duane-micro-oxygenation-in-contemporary-winemaking.pdf

a control batch in stainless steel. Oak chips were added as well.
Well, after less than one month of storage in jerrycans at 15°C, the Shiraz tannin structure changed totally. It went from green, unpleasant, and not integrated, to fine grained and beautifully integrated. Palate length went from horridly short to gloriously long. What a transformation - just as the book described. The stainless steel wine was still displaying unpleasant green tannin and short length.

I calculate that my jerrycans have about 4.5 times the surface to volume ratio of a 200l flextank. So, this means that the jerrycans have about 4.5 times the rate of oxygen transmission. Actually, more than 4.5 if, as I think, flextanks are thicker than the jerrycans.

Now I also made some Grenache this year: I intend to sparkle it. I thought that it would be a good idea to MOX it first. It had the same green-type tannin that shortens the palate, as did the Shiraz. I expected the Grenache to be done faster than the Shiraz, so I checked it after 10 days rather than the four weeks the Shiraz took. Oops, a bit too much, it was a little oxidised. One week would have been enough. The tannin was *melted* nicely though. When I sparkle it, the second fermentation should clean up the oxidation OK. The potential for over-oxidation can be minimised by regular tasting during the MOX period. Something I will need to implement when I repeat the exercise during the 2022 Vintage.

There remained the issue of how to MOX wine immediately post ferment. So, I kept researching, and came across a YouTube video from the University of Texas[6]. In this video the winemaker explains that most people find that the immediate post-ferment MOX Smith recommends is too risky. And can be avoided by oxygenating the ferment. You pump over at length through a venturi that sucks air into the ferment. I will try this next time, as I have tried the Smith method myself, and also found it too hard. Just need to find a suitable venturi for next vintage – I already have the pump.

In the past I always felt like I was cheating when I made red wines in a stainless steel barrel, adding oak chips. Real winemakers use oak barrels surely. But now, looking back on this years' experience, I am not only pleased with the results but delighted that I have a simple method to make really nice wine in less than barrique quantities. (Quantities more in line with what we are drinking these days). Previously I was careful to avoid hard pressing so as not to get bitter tannin into the wine in the first place. Even then, some of my wines were bitter coming up to bottling, so I would fine them with egg white. One of the results of this is that my older red wines lack a nice tannin finish. MOX softens the tannin, without removing it, quite early in the life of the wine, making it more approachable sooner. It has other benefits too. It can improve aroma integration, reduce reductive character and off odours, and can also reduce green vegetative character.

This, of course, was why Penfolds bought Rosemount back in 2001.[7] Penfolds had access to the best grapes, but their top tier wines spent years in barrel, then in bottle bins, until they became ready for release (read until they became drinkable). Rosemount sold medal winning wines in the year of vintage – they had micro-oxygenation technology. Penfolds saw the potential to sell their wine sooner if they could get this technology. Look up the reference to this takeover to read the whole horrible disaster it was, sadly, for almost every other aspect of the operations of both

6 https://www.youtube.com/watch?v=HzDdocnje5E&t=140s
7 https://www.afr.com/politics/blood-on-the-vine-20031231-jejcb

Diego Cappellani: *The rises & falls of the grape, wine & oil industries of my birthplace - ISTRIA*

Diego shares an article he wrote late last year for *Il Globo* …

Wine making, oil making, and fruit growing was brought to our region by the Romans. During their conquest days they realized the potential of the region with dark red volcanic soil, rich with iron and a limestone base, ideal *terroir* and climate for growing grapes and olives. They built the port of Pola in 55AD for the purpose of transporting those goods to the empire, they also built a Colosseum which still stands in excellent condition and is still being used for concerts to this day. According to the local legends, Istria was known as *Orto di Roma* (Roman Garden). The area prospered for some centuries, until Attila the Hun invaded in 440AD. He plundered and burnt the region to the ground and imposed a mortal blow to the great Empire and the region.

It took time, but the region recovered under the auspices of the Roman Catholics. Most of the burnt down towns were rebuilt as Roman Catholicism took hold, trading roots were re-established, and the region repopulated with nationalities of passing traders on their way to the east and migrants from the north and south, bringing new grape varieties and know-how to the region – predominately Italians, who were looking to abandon their warring states for a more peaceful life across the Adriatic Sea. The wine and oil trade also prospered again.

In the 1200s, the kingdom of Italy was broken up into three major states, and Istria became part of the state of Venezia Giulia, including the short occupation by the Hungarian-Austrian empire and, along with it, enjoyed continued progress. The wine-oil industry benefited greatly, both in knowledge and new varieties. Then … World War 2…

WW2 changed everything. The territory was officially handed over to Yugoslavia in 1946, the communist dominance having begun in 1943. Life in general took a big turn under the dominance of the communist regime whose doctrine did not include free enterprise. The rule of law tightened its grip on the population, borders were strictly closed, and a form of martial law was put in place where everyone was under watch and unreasonable taxes were put in place. It became difficult to earn a living and keep the family fed. Within 10 years, production of wine and oil fell by 50%, as many of the inhabitants just abandoned the land and their place of residence. Within 5 years, 250,000 people left the region empty-handed, as they were not allowed to sell their properties and could only leave the country if they signed them off to the government.

We, my family, left in 1957. We were allowed to sell our 30 tonne harvest of grapes, which included Barbera, Teran, Cabernet, Merlot, Bergogna (Gamay) and the bulk of it being Malvasia. Exciting times for us the children, but my parents never really got over the sadness and nostalgia of losing our home and land that the family had held for at least 3 centuries. Ours is only one of thousands of similar stories of the time.

The next 50 years of Communism were basically wasted years in the life of Istrian people. The economy went from bad to worse. Finally, the 1991 Balkan war separated the states, and Croatia became its own Republic. The new government encouraged private enterprise and invited foreign investment in the country. The economy began to move again: new planting of Old World and indigenous grape plantings began in earnest, and the industry got on its way. I visited Istria in 1996 (first time back) and you could feel that there was a new ray of hope within the population.

The art of winemaking had basically left the land with the population that migrated post-WW2, but now families were sending their sons and daughters to Italy and France, and even Australia, to learn the modern way of grape growing and winemaking.

I returned to the region in 2013 and it was evident that great progress had been made with new vineyards and olive groves all over the countryside. Sadly though, most of wine shops were only selling old-world varieties like Cab/Sauv, Pinot and Merlot, although Malvasia dominated the shelves, and not many indigenous varieties.

I am told that it's all changing, as the Croatian government is desperate for international recognition of its own indigenous wines. I really yearn so and hope to revisit my old town once more in my lifetime.

What home project? I just want to get a wine label off.

Jo Ilian Awards – Forward Thinking

Keep an eye on the Jo Ilian Awards beyond this year and the next few years.
The 2021 Jo Ilian is for Best Berry Wine – so try to source some luscious fruit over the summer and start making Berry Wines … and see if you can come up with a winner!

Show Year	***Class***	***Winner***
2022 (Grape)	Best Previous Vintage Less Common Variety Red – other variety (RLP)	TBA
2021 (Country)	Best Berry Wine	TBA
2020 (Grape)	Best Previous Vintage Chardonnay (WCP)	Danny Cappellani
2019 (Country)	Best Stone Fruit Wine (CST, Any vintage, Any Style, Includes CSP)	Noel Legg
2018 (Grape)	Best Previous Vintage Cabernet Sauvignon	Geoff Neagle
2017 (Country**)**	Best Mead Wine (CME, includes JAO)	Trevor Roberts
2016 (Grape)	Best Previous Vintage Pinot Noir (RPP)	David Hart
2015 (Country)	Best Country Wine (excludes Hybrid, Sparkling, Liqueur)	Gary Campanella, Hamish Lucas
2014 (Grape)	Best Current Vintage Dry Grape White wine, Any non-sparkling style, Any Varietal	Danny Cappellani
2013 (Grape)	Best Previous Vintage Red Blend	Danny Cappellani
2012 (Grape)	Best Previous Vintage Shiraz	Gary Campanella, Jid Cosma
2011 (Country)	Best Hybrid	Neil Johannesen
2010 (Country)	Best Herb, Grain, Flower, Veg	Mario and Jean Anders
2009 (Grape)	Best Current Vintage Rose’	Peter Belec
2008 (Country)	Best Sparkling County Wine	David Wood
2007 (Grape)	Best Current Vintage Sauvignon Blanc	NHE Johannesen
2006 (Country)	Best Berry or Currant Wine	David Hart
2005 (Country)	Best Other Fruit Wine	Vinko Eterovic
2004 (Grape)	Best Shiraz	K. Furness, D. Markwell
2003 (Country)	Best Mead	Harry Gilham
2002 (Grape)	Best Riesling	Richard Skinner
2001 (Country)	Best Raspberry	Jacques Garnier
2000 (Grape)	Best Pinot Noir	Philip Hellard

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