



# Winetech Scan

Wine Industry Network of Expertise and Technology  
Netwerk van Kundigheid en Technologie vir die Wynbedryf

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## Research outputs

- Vineyards are usually protected against frost by fans, air heaters or sprinklers; each is limited by environmental constraints or available water. An alternative, all-electrical method has been tested. It involved electrical heating cables, wrapped around the vine cordons, to protect inflorescences from frost damage. A 2-ha block of Sauvignon Blanc in Australia had 5 'treatments' applied. The treatments comprised Control (no cable), No heat, Low heat (6°C above ambient), Medium heat (12°C above ambient) and High heat (17°C above ambient). The vines experienced a single -3°C frost event when at approximately 30% capfall. Non-heated vines suffered 41% (Control) and 46% (No heat) inflorescence loss. Those subjected to Low heat suffered a 28% loss, Medium-heated vines suffered a 16% loss and High-heated vines suffered a 13% loss. More than half of the Medium-/High-heated vines suffered no appreciable damage, whereas all non-heated vines suffered some form of potential crop loss or damage. It was concluded that electrical heating cables of minimum 10 W/m power rating were found to significantly reduce frost damage to inflorescences at 30% capfall. At 43 kW/ha, electrical heating cable offers an alternative frost protection method for small vineyards. <http://dx.doi.org/10.1111/j.1755-0238.2008.00034.x>
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- A bench-scale, fluidized bed for removing potassium bitartrate from wine was tested as an alternative to cold stabilisation. Chilled wine was passed through a bed of potassium bitartrate seed crystals to promote rapid crystallization. The fluidized bed was potentially a better alternative, since only the wine in the bed was chilled, no additional process water was required and the bitartrate was removed without filtering. A heat exchanger reclaimed some of the energy used to cool the wine by contacting the cold product with the fresh feed. Treated wine was returned to the feed tank and layered across the bottom without significant mixing with the untreated feed. Runs of up to 93 hours were performed with little noticeable degradation of performance. The fluidized bed reduced the conductivity of the wine by 640 µS/cm while traditional cold stabilization reduced the conductivity by only 270 µS/cm. Energy consumption was reduced by more than 40%. In 'Abstracts from Presentations at the ASEV 59th Annual Meeting 17–20 June 2008, Portland p33A' in [www.ajeonline.org/cgi/content/abstract/59/3/330A](http://www.ajeonline.org/cgi/content/abstract/59/3/330A)
  - Three different pruning treatments in a single vineyard were been carried out in Australia. The study was conducted over three seasons. Berries from Machine, Cane and Spur-pruned vines were sampled at commercial harvest for analysis of berry size and berry phenolic composition. Wines made from each pruning treatment were assessed for quality by a panel of winemakers. It was found that Machine berries were lighter and had higher concentrations of anthocyanins, tannins and total phenolics than Cane or Spur. However, Machine wines had the lowest quality scores. Comparing vintages, berries from 2004 were lighter, but did not always differ in phenolic composition to other vintages, and wines from 2004 had lower quality scores than the other vintages. Vintage effects were generally stronger than pruning effects. It was concluded that high berry anthocyanins, total phenolics and tannin concentration measures were not good indicators of wine quality scores, and that the vintage year and changes in vineyard treatments (in this case pruning methods) produced potentially important changes in berry size and composition and in wine quality. <http://dx.doi.org/10.1111/j.1755-0238.2008.00019.x>
  - Methoxypyrazines (MPs) are potent aroma-active components found in some *Vitis vinifera* grapes and their wines, particularly Sauvignon Blanc and Cabernet Sauvignon, where low levels of MPs may contribute to the expected varietal aroma and flavour, while elevated concentrations can be unpleasant, often associated with 'unripe' characteristics. Isopropyl-, isobutyl-, and secbutyl-MPs (IPMP, IBMP, SBMP) have all been identified in *vinifera* grapes and their subsequent wine, while IBMP is typically the most predominant MP present and generally believed to contribute most sensorially. However, recent findings suggest that IPMP may play a more important role in wine flavour than previously thought, contributing 'green characters'. Aside from its contribution to 'normal' wine flavour, IPMP has recently been identified as the causal compound of ladybug taint (LBT), an off-flavour of juice and wine due to incorporation of *Harmonia axyridis* (Pallas) beetles, also known as the multicoloured Asian lady beetle (MALB), with the grapes during juice and wine processing. MALB are found in many winemaking countries, including South Africa, where they have often been introduced as biocontrol tools for aphids. A Canadian study sought to determine the influence of commercial *Saccharomyces* yeast strains on IPMP concentration in Cabernet Sauvignon wines and to describe their sensory impact. It was found that various yeast strains differed in their sensory impact on wine made from IPMP-spiked juice for five aroma and four flavour

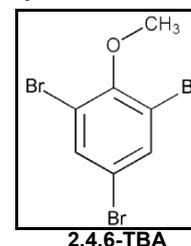
attributes. The study concluded that wine yeasts have the capacity to affect IPMP concentration and that they had varying abilities to mask green or ladybug taint characters in wine. The information should be useful in guiding selection of yeast strains for juices of high IPMP concentration, including those that are multicoloured Asian lady beetle-affected, under-ripe, or from varieties with high methoxypyrazine loads such as Cabernet Sauvignon. <http://dx.doi.org/10.1111/j.1755-0238.2008.00026.x>

## Local research results

- In South Africa Shiraz decline disease is clearly associated with Shiraz clone 99 imported from France in 1982. A study of the virus status of this Shiraz clone 99B infected with Shiraz decline has revealed intriguing facts but did not lead to a finding of a clear-cut association of viruses with the disease. Reverse transcription polymerase chain reaction (RT-PCR) amplification of dsRNA, extracted from a nucleus plant of Shiraz clone 99B infected with Shiraz decline, followed by cloning, analysis and sequencing, showed that this plant is infected with uniform populations of viruses related to Rupestris stem pitting-associated virus (RSPaV-SY) and Grapevine virus B (GVB). This correlated with another study, in which it had been found that the RSPaV-SY type strain was closely associated with Syrah or Shiraz decline. GVB is transmitted by the mealybug *Planococcus ficus*, which is common in local vineyards. GVB is associated with Corky Bark (CB) disease, whose symptoms resemble, in many respects, those of Shiraz decline. However, testing of 52 field-collected Shiraz plants of various clones both affected and not affected by Shiraz decline for GVB, showed that that not all variants of the virus are detected by standard RT-PCR methods. Extensive variability of GVB found in Shiraz clones suggested that planned large-scale detection of the virus in field plants using standard RT-PCR. Further work has not, at this stage, improved detection of the virus. The study also revealed that the RSPaV-SY strain, despite having been reported as closely associated with Shiraz decline, was present in various local clones of Shiraz both affected and not affected by the disease. [www.sawislibrary.co.za/dbtextimages/FinalReport131.pdf](http://www.sawislibrary.co.za/dbtextimages/FinalReport131.pdf)

## Short reviews

- A review article examines the use of wood in modern-day winemaking under the headings of: Wood and Toasting; Powders, Chips, Blocks and Staves; Barriques and Casks; Oxygen; Hygiene and Control; and Barrel Cellar and Maintenance. It presents some examples of how wood is used in modern day winemaking. Interestingly it notes that European Community law authorizes the use of alternatives to barrels where the wood particle dimensions result in at least 95% by weight of the particles being retained by a sieve with a porosity of 2mm, whereas in the 'New World' the use of oak powders is permitted. [www.infowine.com/intranet/news2006/nl.asp?id=568](http://www.infowine.com/intranet/news2006/nl.asp?id=568)
- The undesirable musty, mouldy taint found in some wine can be traced to the presence of haloanisoles, specifically 2,4,6-trichloroanisole (2,4,6-TCA) and the more recently identified 2,4,6-tribromoanisole (2,4,6-TBA). These compounds can cause the taint in wine at very low concentrations, measurable in parts per trillion. The result is poor wine quality, negative publicity, and an annual financial cost to the wine industry estimated at \$10-billion worldwide. A short review article highlights the emerging 2,4,6-TBA problem. Haloanisoles are formed from halophenol compounds by microbes, such as filamentous fungi, via a process called biomethylation. Specifically, 2,4,6-TBA is formed from the biomethylation of its precursor, 2,4,6-TBP. The winery environment has many possible sources of 2,4,6-TBP, such as painted surfaces in the cellar, sealants, barrels, oak adjuncts, wood ladders, wooden catwalks, wood pallets, plywood, wooden rafters, wood beams, water, water hoses, wine hoses, plastic tank liners, plastics, insulation, filter pads, fining agents, packaging materials (cardboard, adhesives, paper bags), cleansers, and sanitizers. Thus the probability of 2,4,6-TBA formation in a winery environment is very high. A number of pro-active measures for dealing with the problem are presented. [www.practicalwinery.com/novdec08/page1.htm](http://www.practicalwinery.com/novdec08/page1.htm)
- The evolution of wines is influenced by the oxidation phenomenon, which is dependant on the presence of oxygen. Controlled oxygenation contributes to the stabilization of the colour and to a reduction of astringency in red wines. However, it appears necessary to protect white wines, which are intended to be drunk young, from oxygen. It is also accepted that forced oxygenation is not favourable for the quality of wines. A short review of the sources of oxygen dissolved in wines. Solutions for controlling and reducing these sources are discussed. <http://www.infowine.com/default.asp?scheda=7493>
- A review of colour extraction from red wines discusses the source of colour which is mainly anthocyanins. The anthocyanins are located in the vacuoles of the cells making up the grape berry skin. The various options of extracting the colour from the cells of the skin are discussed. These are crushing, enzymatic treatments, SO<sub>2</sub> and mechanical or physical actions, namely pumping over, 'delestages', 'pigeages', pressing, and pressure and vacuum (flash-detente, thermo-detente) on whole harvests. The temperature at which the extraction is carried out is also relevant. <http://www.infowine.com/default.asp?scheda=7128>



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