



## Local Research News

### Factors influencing SA white wines during bottle ageing

A project has investigated the effect of different antioxidant treatments and storage temperatures on the bottle ageing of South African Sauvignon blanc (2008 and 2009) and Chenin blanc (2008 and 2010) wines. In the first year of the project (2008 vintages), it was found that temperature played a larger role in the development of the wine than did antioxidant additives such as ascorbic acid. Changes in the sensory characteristics and some chemical changes were also observed.

The 2009 and 2010 vintages were exposed to different temperatures, as well as variable temperatures during a stimulated transport trial. A trained panel was clearly able to distinguish the 37°C storage wines from the -4°C, the variable temperature, and the 15°C stored wines. They were not able to clearly distinguish between the Chenin blanc (closed with screw cap) wines stored at the lower temperatures, but did note small differences in the Sauvignon blanc wines (closed under cork). It was concluded that 'accumulated' temperature played a larger role in forming off-odours than variable temperatures during shipping. [www.sawislibrary.co.za/dbtextimages/DuToitWJ6.pdf](http://www.sawislibrary.co.za/dbtextimages/DuToitWJ6.pdf)

## International Research News

### Effect of packaging and temperature on Chardonnay

Californian Chardonnay was stored in five different wine-packaging configurations at three different temperatures (10, 20 and 40°C for 3 months in the dark to study the combined packaging and temperature effects on the sensory and chemical properties of the wines. The packaging was three different bottle closures (natural cork, synthetic cork, and screw cap) and two bag-in-box configurations (with and without modified atmosphere packaging). Increased storage temperatures induced the largest changes in the wines. Wines stored in bag-in-boxes at 40°C showed significant increases in oxidized and vinegar aromas and yellow colour. Volatile esters also decreased in these wines, while increased levels of compounds generally associated with age- or heat-affected wine were found. Bottle storage with various closures (natural cork, synthetic cork, and screw cap) changed the wine in a different way than bag-in-box storage. Bag-in-box wines are more likely to develop unpleasant flavours, aromas and colours when stored at warm temperatures <http://dx.doi.org/10.1021/jf302910f>

### Chemical and Sensory Profiles of US Cabernet Sauvignon wines and blends

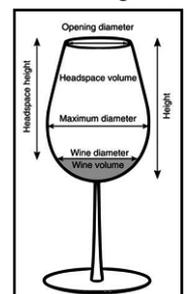
Cabernet Sauvignon is the most widely planted red grape variety in the United States. The wines can vary greatly in style, depending on the region and price point. The first study to characterize the aroma and flavour profiles of such wines has now been carried out. A analytical method was developed to measure 61 volatile compounds. The compounds monitored included grape-derived norisoprenoids and terpenes; fermentation-derived esters, higher alcohols and aldehydes; *Brettanomyces*-related compounds and oak-derived compounds; and methoxy-pyrazine.

Twenty-four commercial wines, encompassing a broad range of wine styles were analyzed. The results were compared to a descriptive sensory analysis of the wines using trained assessors, to determine the extent to which the chemical analyses could predict sensory profiles. The rapid, targeted profiling method developed was able to predict a number of aroma sensory descriptors. The Cabernet Sauvignon wines and blends differed in their chemical and sensory profiles, and were differentiated in part, as a result of the direct and indirect influences of varying alcohol levels. The work provides the wine industry with the ability to rapidly assess wine volatile composition. <http://dx.doi.org/10.5344/ajev.2012.12107>

### The effect of glass shape and equilibration time on the sensory properties of Gewürztraminer wine

The relationship between glass shape and chemical composition of headspace in the glass and the relationship between glass shape and sensory characteristics were investigated for a Gewürztraminer wine in five glass shapes (white wine glass, Bordeaux red wine glass, red wine glass, INAO wine tasting glass, and Erlenmeyer glass) over three equilibration times (0, 5 and 10 minutes). The headspace composition above a wineglass was found to vary significantly with glass shape, equilibration time, and the interaction between glass shape and equilibration time. Glass shape parameters were better correlated with headspace chemical composition at longer equilibration times compared to shorter times. Aroma sensory descriptor intensities were found to vary significantly for glass shapes at different equilibration times.

Despite these significant effects, no correlations between glass shape parameters and aroma sensory descriptor intensities were found. Glass shape had little influence on aroma intensity at zero minutes of equilibration but had more impact at 5 and 10 minutes of equilibration. The Bordeaux and INAO glasses enhanced fruitiness and total aroma intensity at longer equilibration times, while the red wine glass enhanced the hot, ethanol character. Both the sensory and chemical evidence showed that wine in a glass does indeed qualitatively and quantitatively change, or 'open up', over a 10 minute period. <http://dx.doi.org/10.5344/ajev.2012.11113>



## Using a combination of temperature and sulphur dioxide to control Brett in wine

To reduce reliance on sulphur dioxide (SO<sub>2</sub>), a preliminary investigation examined the interactive impact of temperature and SO<sub>2</sub> concentration. Identical wine samples were cooled to four different temperatures between 10 and 22°C. *Brettanomyces bruxellensis* was introduced and, after an acclimation period, varying amounts of SO<sub>2</sub> were added. Results showed that the combination of temperature reduction and SO<sub>2</sub> addition had a greater effect than either treatment independently. There was a 'sweet spot' where the combination treatment had the greatest efficacy. With temperatures of 15°C and below, a molecular SO<sub>2</sub> concentration of 0.25 mg/L was sufficient to control the three strains of Brett that were tested in the laboratory, preventing the emergence of undesirable aromas and flavours. This SO<sub>2</sub> concentration was significantly below the 0.4-0.6 mg/L concentration often recommended for aging wine under commercial conditions. [www.infowine.com/default.asp?scheda=11708](http://www.infowine.com/default.asp?scheda=11708)

## Converting from overhead sprinkler to drip irrigation

The Okanagan Valley appellation in south-western British Columbia in Canada is a semiarid production region. The effects of converting from overhead sprinkler to drip irrigation on the growth, leaf gas exchange, and fruit production of Merlot grapevines in this region, with and without cluster thinning, were investigated over four years. Drip or sprinkler irrigation was applied to the loamy sand soil when in-row soil moisture was depleted to <8%. Irrigation frequency averaged 50% higher (27 compared with 18 times per year) under drip than sprinkler irrigation, but 64% less water (574 compared with 1580 litres per vine per year) was applied on average under drip. Maps of moisture in the soil profile revealed differences in moisture distribution and dry-down dynamics in response to irrigation method. Increasing soil dry-down rates over the study period indicated that roots proliferated within the drip-irrigated soil volume. Converting to drip reduced the growth and survival of ground vegetation.

Vine vigour, leaf gas exchange, and crop yield were reduced but crop yield recovered in the second year and vigour recovered by the fourth year. Stomatal conductance and leaf gas exchange remained lower under drip irrigation. Transpirational water-use efficiency was higher under drip than sprinkler irrigation in the first three years. Input water use efficiency averaged 2.5 times higher under drip irrigation over the four years. Fruit maturation was advanced by drip compared with sprinkler irrigation each year and was associated with increased cluster exposure and higher ambient temperatures. Cluster thinning also advanced fruit maturation but reduced crop yield substantially each year and had only minor interactions with the irrigation method used. Drip irrigation appears to be particularly beneficial in regions where water conservation is a priority and where limited seasonal heat limits fruit maturation. However, the reduction in growth of ground vegetation, especially on sandy soils in a low-rainfall climate, could lead to increased soil erosion, poor traction, and changes to vineyard ecology that affect pest management. <http://dx.doi.org/10.5344/ajev.2012.12002>

## Proposed micrometeorological indices

Meteorological parameters have a crucial influence on grapevine production quantity and quality. However, most of the commonly used bioclimatic indices are not appropriate for representing intravineyard micro-meteorological variability, in particular the subdaily dynamics that are important in grape maturation processes. A study has proposed a new set of micrometeorological indices and has evaluated their capacity to discriminate the differences in the microclimatic daily cycle induced by different canopy management techniques. The study is based on a statistical data set of three years (2008-10) of hourly data of cluster internal temperature, canopy air temperature, and solar radiation, collected in four vineyards planted with Sangiovese and Cabernet Sauvignon, in three climatic zones of Tuscany, Italy.

Results show that the use of indices based on micrometeorological parameters collected at subdaily time resolution substantially improves the representation of the daily cycle, providing a more accurate synthesis of the environmental conditions in the canopy during the growing season than do traditional indices computed from parameters with daily resolution. The enhanced capacity to appropriately monitor microclimate in vineyards is a step toward understanding the relationship between canopy management and microclimate and implementing operational high-resolution farm-scale surveys for precision viticulture applications. The improvement of parameterization of canopy microclimate, through more sensitive indices, could help to further improve the understanding of the microclimate-quality relationship. Those aspects are expected to be of crucial importance for wine-makers for the adoption of appropriate canopy management practices in view of projected climate changes. <http://dx.doi.org/10.5344/ajev.2012.11117>

## Other News

### Wine stabilisation by ion-exchange

The STABTAR is an ion-exchange resin based system for lowering the concentration of potassium (K<sup>+</sup>) ions in wine and thus providing an alternative method of achieving tartaric stability by reducing the amount of potassium bitartrate in solution. The resin takes up the K<sup>+</sup> ions and releases (or exchanges them for) hydrogen ions (H<sup>+</sup>). This also lowers the pH and thus reduces the risk of malolactic fermentation. It is claimed that the system enhances wine freshness, stabilises aroma and reduces bitterness. The system has very short regeneration time, fully automatic operation via computer control, and has a throughput of 500 to 4 200 hectolitres per 8 hour day, depending on the model. [www.infowine.com/docs/ever-brochure-STABTAR.pdf](http://www.infowine.com/docs/ever-brochure-STABTAR.pdf)

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