



## Research news

- The adsorption of sulphur dioxide (SO<sub>2</sub>) on cork has been studied in the gas phase for the first time. The results show that adsorption capacity of SO<sub>2</sub> on cork is rather low, and thus the amount of SO<sub>2</sub> that can be trapped by a standard cork stopper from the headspace of bottled wine is negligible. Thus adsorption on cork cannot account for the decrease of SO<sub>2</sub> content in wine during aging. The interaction of SO<sub>2</sub> with cork is mainly governed by a physisorption process. Surprisingly, in the presence of water pre-adsorbed on cork, the adsorption capacity of cork for SO<sub>2</sub> is reduced by a factor of 3, probably because of the occupancy of the adsorption sites by water molecules. Thus, competitive adsorption mechanisms between water and SO<sub>2</sub> could occur on cork, also indicating that many other polar molecules, such as ethanol, are susceptible to adsorb selectively with SO<sub>2</sub> on cork. In that case, the real adsorption capacities could be very different than those determined (as in this study) from the adsorption of single components on cork. [www.ajevonline.org/cgi/content/abstract/60/2/138](http://www.ajevonline.org/cgi/content/abstract/60/2/138)
- Evaluation of more than 6 000 blind tastings has found that individuals who are unaware of the price do not derive more enjoyment from more expensive wine. The data set contained 6 175 observations from 17 blind tastings which took place in the US in 2007 and 2008. In total, 506 participants tasted wine flights composed from 523 different wines. The wines were presented in a double-blind manner, so that neither the person serving the wine nor the person tasting the wine knew the identity, price, or any other characteristics of the wine aside from its colour. The study found the correlation between price and overall rating was small and negative, suggesting that individuals on average enjoy more expensive wines slightly less. For individuals with wine training, however, there were indications of a positive relationship between price and enjoyment. The robust statistical results suggest that non-expert wine consumers should not anticipate greater enjoyment of the intrinsic qualities of a wine simply because it is expensive or because it is appreciated by experts. [www.wine-economics.org/journal/content/Volume3/number1/Full%20Texts/01\\_wine%20economics\\_Robin%20Goldstein\\_vol%203\\_1.pdf](http://www.wine-economics.org/journal/content/Volume3/number1/Full%20Texts/01_wine%20economics_Robin%20Goldstein_vol%203_1.pdf)
- It has been found that (in France) chemical weeding is the lowest cost (including labour) option for vineyards. Complete chemical weeding had a cost of 300 €/ha (Euros per hectare). Chemical weeding along rows and controlled green cover between rows had a cost ranging between 350 and 400 €/ha, depending on the number of treatments. 400 €/ha was also the cost for chemical weeding along rows, associated with the terrain ploughing between rows. Finally terrain ploughing along rows coupled with green cover between rows had a cost of around 500€/ha. The strategy of whole terrain ploughing had the greatest cost of 600 €/ha, double that of the chemical weeding. [www.infowine.com/default.asp?scheda=8192](http://www.infowine.com/default.asp?scheda=8192)
- Deficit irrigation is a production tool used on wine grapes and other perennial fruit crops to manage vegetative and reproductive growth for enhancement of product quality or to increase water use efficiency. Deficit irrigation regimes imposed before veraison restrict vine vegetative growth and this reduction in growth permits higher canopy light transmission, which in turn increases the cluster exposure to sunlight, resulting in beneficial increases in skin phenolics for wine production. However, a higher incidence of sunburned fruit has been observed under deficit irrigation in warm, semiarid production regions with high solar radiation. Foliar application of a white kaolin particle film has been shown to reduce such thermal stress by increasing foliage infrared radiation, thereby reducing leaf and fruit tissue temperature in a number of crops. One of the primary ways that wine grapes maintain positive leaf cell turgor (pressure) during water deficit is by closing leaf stomata to restrict loss of water vapour through transpiration. A study has been carried out to investigate how foliar application of kaolin particle film influenced diurnal leaf gas exchange, leaf water potential, yield, and berry maturity of a red (Merlot) and white (Viognier) wine grape cultivars under differing levels of water stress over two growing seasons in the warm, semiarid climate of south-western Idaho. Net diurnal stomatal conductance (g<sub>s</sub>) was increased by particle film and the effect varied according to vine water status. Particle film delayed the onset of diurnal decline in g<sub>s</sub> under mild water stress (leaf water potential -1.2 MPa) but had no influence on leaf gas exchange when vines were under greater water stress (leaf water potential -1.4 MPa). Correlation between soluble solids concentration and titratable acidity (Viognier) and between berry fresh weight and yield (Merlot) was higher with than without particle film, suggesting that particle film may attenuate the influence of other factors affecting expression of these traits. Particle film was associated with an increase in berry weight in Merlot and with an increase in berry soluble solids concentration in Viognier, suggesting that the film may increase vine-carrying capacity. Midday leaf water potential throughout the growing season was not influenced by particle film. Fruit surface browning was observed on deficit-irrigated, particle film-treated vines on exposed clusters on the west side of the canopy,



indicating that the film did not completely eliminate development of heat stress symptoms. <http://hortsci.ashspublications.org/cgi/content/abstract/43/5/1392>

- A study to determine the effect of price on the rating of wine was conducted in Boston at the end of 2008. 135 individuals (40% women) tasted and rated a red wine with a retail price of \$40, and 131 individuals (33% women) tasted and rated a red wine with a retail price of \$5. There were three different settings. In the 'blind' setting, the price was not mentioned at all. In the 'before' setting, the price was mentioned prior to tasting the wine. In the 'after' setting, the price was mentioned after the tasting, but before subjects were asked to rate the wine. Disclosing the high price before tasting the wine produced considerably higher ratings, although only from women. Disclosing the low price, by contrast, did not result in lower ratings. Neither women nor men assigned higher ratings to the wine when they were informed about the price after tasting. There was a noticeable tendency for men to assign lower ratings to the wine when they were told about the price after tasting. The researchers concluded that hosts offering wine to guests can safely reveal the price, with much to gain if the wine is expensive, and little to be lost if it is cheap. [www.wine-economics.org/workingpapers/AWE\\_WP35.pdf](http://www.wine-economics.org/workingpapers/AWE_WP35.pdf)

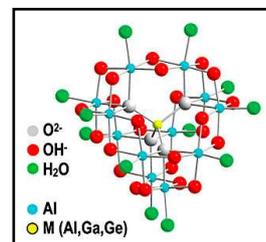
## Environmental Concerns – Water and Waste

- Sonoma Wine Company, the largest custom service winery in Northern California, is experimenting with a new distillation process that will reclaim and conserve up to 9 000 litres of wastewater daily. It has installed a 380 litre-per-hour 'Wiped-Film Rotating-Disk' evaporator distillation system. The unit is producing product water at 90 percent efficiency, and the next step will be to increase it to 95 percent and to add a catalytic oxidation filtration system for final processing. The recycled water is salt-free and can be used for barrel and equipment cleaning. It is of a quality that permits it to be discharged directly into local sewer and drainage systems. The winery is finding that the benefits of reducing containment ponds and their related costs in energy, construction, maintenance and land usage are accentuated with the positives of recycling water. [www.winebusiness.com/wbm/?go=getArticle&dataId=64554](http://www.winebusiness.com/wbm/?go=getArticle&dataId=64554)



- Annually around 700 million tons of agricultural wastes are produced within the EU, presenting a challenge to that are obliged to get rid of them. At present, manure and crop residues receive the cheapest treatments, although these are not the most adequate ones. Upgrading to biogas production by means of anaerobic digestion (AD) represents an alternative treatment with much potential as it not only prevents pollution, but also allows for energy and nutrient recovery. The AGROBIOGAS (An integrated approach for biogas production with agricultural waste) project, backed by the EU's Sixth Framework Programme (FP6) with €2.1 million in funding, has set its sights on developing this technology. There are still many challenges to be solved in order to make this technology effective to treat agricultural waste and widely accessible to European farmers. AGROBIOGAS feels that the project is unique because of the integrated approach taken for the development of the biogas sector, as is illustrated the Helpdesk ([www.adhelpdesk.eu](http://www.adhelpdesk.eu)) which is a platform for people who need advice or consultation concerning the operation of agricultural biogas plants. To date AGROBIOGAS reports a number of achievements including an AD process simulation toolkit and a biogas substrate database in which information is gathered for 25 different substrates for biogas production, including biogas yield and chemical composition for each of the substrates. [www.agrobiogas.eu](http://www.agrobiogas.eu)

- Prehydrolyzedaluminium, also known as polyaluminium chloride (PACl), has consistently shown enhanced removal of a variety of contaminants including natural organic matter, bacteriophage, and turbidity from water supplies. PACl has a cage-like Keggin structure (named after J.F. Keggin who first experimentally determined the structure) with the cage consisting of 12 aluminium (Al) atoms and one central Al atom. Researchers have examined replacing the central Al atom in PACl with gallium (Ga) and germanium (Ge). They found that single Ga atom substitution in the Al<sub>13</sub>-polycation that is abundant in PACl markedly enhances contaminant-removal performance and improves shelf life. The GaAl<sub>12</sub> has proven a superior coagulant reagent in every single test due to its kinetic stability and high charge in aqueous media: both in its lower acidity and tendency *not* to form larger clusters and oligomers. For example, in river water containing wild-type bacteriophages at a concentration of 5×10<sup>7</sup> plaque forming units (pfu) per millilitre, alum reduced this to 8×10<sup>5</sup>, PACl to 6×10<sup>3</sup> and GaAl<sub>12</sub> to 4×10<sup>2</sup> pfu/mL. Substitution with Ge did not outperform PACl. The researchers noted that the extra cost of producing GaAl<sub>12</sub> was not likely to be much more than the cost of producing PACl, and that even small differences in the efficacy of water-treatment technologies at low cost can potentially mean more reliable treatment of challenged water supplies. Gallium is innocuous, as well as sequestered in the core of the cluster with no contact to the surrounding aqueous medium. They estimate that the improved efficacy and longer shelf life of GaAl<sub>12</sub>-based additives means overall lower dose rates per volume of water treated. <http://pubs.acs.org/doi/abs/10.1021/es803683t>



Winetech Scan is available on the Winetech website [www.winetech.co.za](http://www.winetech.co.za)

To subscribe please email Gerard Martin: [marting@winetech.co.za](mailto:marting@winetech.co.za)