



Winetech Scan

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

April 2008

Research outputs

- HPLC analysis of polyphenols, anthocyanins, and indole-3-acetic acid (IAA) in wine can be very time and chemical consuming, involving several clean-up steps and, in many cases, different analytical methods. Now a new reversed-phase HPLC method for such determinations is reported. No sample preparation is required and the analysis time is 57 minutes per sample. The detection limit for IAA was 2 µg/L and for phenolics ranged from 0.1 to 1.0 mg/L. This more rapid, easy, and cost-effective method only requires filtration and could be useful when numerous samples have to be analyzed. www.ajevonline.org/cgi/content/abstract/59/1/106
- The debate over a suitable method for assessing tannin levels in grapes and wines continues. A study which analysed tannin levels in the skins of 36 different cultivars using three common analytical methods found that, although there were substantial differences between cultivars, there were significant differences in the results between the methods used and no correlation between these methods. The study concluded that each method analyses a different fraction of the total extractable tannins in grape skin, and the mechanism driving this difference requires ongoing research. <http://dx.doi.org/10.1111/j.1755-0238.2008.00007.x> Another study evaluated the reliability of tannin analysis by protein precipitation of five commercial red wines having different tannin levels. Tannin concentrations of very diluted and of concentrated samples were systematically underestimated, which could be due to a precipitation threshold and insufficient protein for precipitation, respectively. It is recommended that, to ensure reliable tannin quantification, sample dilutions are carefully carried out to give a tannin response between 0.3 and 0.75 absorbance units. www.ajevonline.org/cgi/content/abstract/59/1/103 An 'electronic tongue', an analytical method using an array of chemical sensors and mathematical signal treatments, was used to assess oenological tannins. Taste threshold concentrations of the liquid sensors exceeded human taste sensations by a two-fold factor. It was found to be a rapid analytical method that does not need sample preparation and which could be considered as a prospective tool for the quality control and characterisation of tannins, replacing subjective and expensive tasting panels. [www.sasev.org/journal/sajev-articles/volume-28-2/vol%2028\(2\)%20Puech%2C%20Prida%2C%20Isz%20pp%20101-106.pdf/view](http://www.sasev.org/journal/sajev-articles/volume-28-2/vol%2028(2)%20Puech%2C%20Prida%2C%20Isz%20pp%20101-106.pdf/view)

Local research results

- A glasshouse study over two growing seasons investigated salt removal and nutrient uptake by salt accumulating plants as means of secondary wastewater treatment. Old man saltbush, vetiver grass, lucerne, rye and kikuyu grass were irrigated with treated wastewater from a distillery (high strength wastewater) and a winery (medium strength wastewater). The study found that plants growing in distillery wastewater had higher concentrations of various elements (as expected). Compared to old man saltbush, vetiver grass was more tolerant to the wastewaters and accumulated most elements into its system, making the plant a candidate species for use in treatment systems. For the accumulation or removal of residual elements in wastewaters, kikuyu and rye grass are the candidate species as they not only showed tolerance, but accumulated high levels of sodium and potassium in harvestable (shoots) tissues, The sodium and potassium could pose an environmental threat if they leached directly into the soil. www.sawislibrary.co.za/dbtextimages/FinalReport142.pdf
- A survey of skills of farmers, farm workers, cellar managers, cellar workers and office staff in the Robertson Wine Valley found that most farmers and managers did not trust the majority of their workers to execute vineyard practices correctly, resulting in vigilant supervision, especially in the case of casual workers. Almost 25% of all workers interviewed could not read or write and only 75% had some level of primary education. Most of the training at farm level was done informally by the farmer or farm manager and did convey 'deep' knowledge about the vine plant or viticulture. As a result most workers were not able to exercise discretion and judgement when confronted with an abnormal situation. While most producers were positively disposed towards the idea or concept of a regional training facility, it would be necessary to find a funding formula that is both affordable to the producer and sufficient to finance staffing the facility. Workers' newly acquired skills would need to be recognised by employers by increased remuneration or by promotion. If farmers were to treat all workers as an undifferentiated category of 'general workers' regardless of newly acquired skills or productivity gains, this would kill off ambition and enthusiasm. On the other hand, by rewarding employees for showing effort and ambition, employers could create a workplace climate of diligence, dedication, loyalty and pride, and would be able to better compete in world markets. www.sawislibrary.co.za/dbtextimages/EwertJW.pdf



Health Effects

- The importance of appropriate wine consumption in the prevention of cardiovascular disease has been stressed in a considerable number of recent articles. However, the results of studies on this topic are inconsistent, indicating that the general approach to the issue needs to be revisited before further research is conducted. A review of recent studies raised a number of points for consideration. These were: (1) the necessity to characterize wine analytically, as the content in important components of wine, such as resveratrol, is influenced considerably by regional factors; (2) the bioavailability of the components of wine; (3) the lack of importance of wine colour, as white wine consumption also affords benefit; (4) the recommendation by the World Health organisation (WHO) to 'investigate the possible protective effects of ingredients other than alcohol in alcoholic beverages'. <http://dx.doi.org/10.1016/j.atherosclerosis.2007.04.006>
- A study of an Italian white and an Italian red wine showed that the wines exerted in vitro antibacterial activity against several oral streptococci and *S. pyogenes* and induced postcontact effects against *S. mutans*. The findings seem to indicate that wine can act as an effective antimicrobial agent against the tested pathogenic oral streptococci and might be active in caries and upper respiratory tract pathologies prevention, suggesting that wine enhances oral health. <http://pubs.acs.org/cgi-bin/abstract.cgi/jafcau/2007/55/i13/abs/jf070352q.html>

Climate change, CO₂ and carbon footprints

- The 2nd World Congress on Climate Change and Wine in Barcelona in February 2008, hosted by the Wine Academy of Spain, was attended by more than 350 participants from 41 countries. Delegates heard that there is incontrovertible evidence that changes in temperature of even one degree translate into dramatically different weather. A theme was that matching grape variety to region and even site will have to change, as vines adapt but probably not quickly enough. It was also necessary for mental attitudes to change, so that the producer uses less water, less energy, and practices a more holistic agriculture. The effects of CO₂ and UV radiation on vines were described, underlining the impact on grapes from different regions and on water resources, changes in growth cycles and options for mitigation and adaptation. A pilot project in Chile which trapped and stored CO₂ emissions underground was described. Participants carried out a blind tasting of 10 wines affected by climate change. www.europeanwineacademy.org/index.php?cat=27 and www.jancisrobinson.com/articles/20080224_5
- Distell is actively engaged with suppliers, wine industry bodies and academic institutions in reducing its carbon footprint. It is currently piloting the capture and re-use of CO₂ released during the production of its apple ciders at its manufacturing plant in Paarl. The CO₂, purified to food grade, is used to carbonate Distell's ciders and ready-to-drink beverages. The company's latest initiative is just one example of its efforts to contain its impact on the environment. Central to any strategy designed to curb greenhouse gas emissions is the capacity to measure output. The system Distell uses as a measurement for quantifying CO₂ emissions that occur throughout the growing, production, packaging and transportation of wine is the International Wine Industry Greenhouse Gas Accounting Protocol and Calculator system. It measures a number of things, including the impact of nitrogenous fertilisers, the carbon absorption by vines, fuel use, refrigeration, fermentation emissions as well as CO₂ used in processing. It also takes into account the treatment of waste, packaging, freight and employee travel. www.news24.com/News24/Technology/News/0,,2-13-1443_2264276,00.html

Closures

- The so-called glass-on-glass closure system (Vino-Lok) is gaining acceptance in South Africa, with 120 000 units used in 2007 by six wine estates. A stopper with a plastic o-ring seal is applied to the bottle and is closed with an aluminium overcap, the condition of this cap providing evidence of any tampering. The glass stopper and overcap are applied by hand, but a machine can be used when bottling volumes are high. The contents of already opened bottles can be repeatedly re-sealed. The stoppers and the bottles are imported and are completely recyclable. A simple test by your Editor showed that locally produced wine bottles with a suitable internal neck diameter can also be resealed with the Vino-Lok closure. A local research study using four white and two red wines with natural corks and glass stoppers found no differences (chemical analysis or tasting) between the samples after bottling, and 1, 3, 6 and 12 months later (except that some of the cork-stopped wine had a cork/mouldy taint). google.com/search?q=cache:Q9K9DL_xkZkJ:platform.europeanwineacademy.org/file.php/1/moddata/forum/3/152/glass_bottle_stoppe rs.pdf
- In Spain, a law outlaws the use of alternative wine closures in 11 of Spain's top wine producing regions. Only cork can be used as a closure for still and sparkling wines in order to gain D.O. (Denominacion de Origen) status. http://findarticles.com/p/articles/mi_m0EIN/is_2006_March_27/ai_n16113664



Winetech Scan is available on the Winetech website (www.winetech.co.za) and a blog there welcomes readers' comments, opinions and feedback. To subscribe please email Gerard Martin: marting@winetech.co.za