Winetech Scan
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Local Research News

Effects of geology, soil and climate on wine style/quality in Helderberg

Little scientific information regarding the effect of different geological materials on wine style and/or quality is currently available in South Africa. A five year investigation into such effects was carried out in the Helderberg area of the Western Cape, where soil material may change from granite to shale over short distances. Two Sauvignon blanc and two Cabernet Sauvignon vineyard blocks were selected at four different localities. Soils derived mainly from shale, and from granite, were identified within each block. Climatic, soil, grapevine, juice and wine data were obtained. Granitic soils contained significantly higher concentrations of coarse sand, but less fine sand, than shale-derived soils. Because of these differences, water holding capacities were generally higher in the shale- than in granite-derived soils. Shale-derived soils contained higher concentrations of total potassium (K), but the levels of soluble K were generally greater in the granitic soils. Nitrogen concentrations of juice were higher in grapes from shale-derived than from granitic soils. The magnitude of this difference was affected by cultivar, season and locality. Geological material did not affect juice K concentrations consistently.

In terms of wine style/quality, Sauvignon blanc seems to be affected by geological differences to a smaller extent than Cabernet Sauvignon. However, Cabernet Sauvignon wine style/quality is not affected by geology in a consistent manner, with wine from the shale-derived soil being better during some seasons, while the opposite may occur during other seasons. The latter (better wine from granite-derived soil), seems to be especially noticeable during cooler (and wetter) seasons. It was, however, noted that in general, climatic conditions and cultivation practices such as soil preparation, fertilization and irrigation, may have negated the effect of geological material on grapevine performance and wine quality to a significant extent in most vineyards. www.sawislibrary.co.za/dbtextimages/Winetech2010_19.pdf

Optimisation of fungicide spray application

A research programme has investigated the optimisation of fungicide spray application in grapevine vineyards. Using the fungicide fenhexamid, laboratory benchmark values for biologically effective deposits of fenhexamid acting against *Botrytis cinerea* infection were determined on bunches and leaves of table (Waltham Cross) and wine (Chenin blanc) grapes. In order to visualise spray deposition on target surfaces, pigments were added to the spray, and a spray deposition assessment protocol using fluorometry, macro-photography and digital image analyses was developed and validated. Fenhexamid was applied by commercial air blast and air shear spray applicators with a range in spray volumes. The spray was also mixed with one of 15 different commercial adjuvants (in this case an adjuvant is a compound which can significantly improve coverage, absorption, and efficacy of a fungicide).

Spraying was conducted during set, pea size, bunch closure and preharvest. It was found that coverage values of fenhexamid were generally lower than the benchmark values that had been established. The air shear sprayer performed most efficiently and markedly better at low volume (250-500 l/ha), whereas the air blast sprayer performed more consistently over a wider range of volumes. Spray deposition was remarkably improved through optimal use of spray applicators. The study clearly demonstrated the potential of some adjuvants to improve quantitative and qualitative deposition, but highlighted the necessity to match adjuvant dosages and application volumes on the spray target to achieve maximum spray deposition. www.sawislibrary.co.za/dbtextimages/Winetech2010_14.pdf

International Research News

Citrus flavours analysed

The aliphatic aldehyde series present aromas that range from the green aroma associated with lower aldehydes to the citrus fruit aroma of aldehydes with 8–11 carbon atoms. These C8–C11 aldehydes are quite common in nature and there is evidence that existing analytical methods for their determination are affected by contamination of the reagents used and possible air contamination in the workplace. As a result, a new analytical method has been developed for these aliphatic aldehydes in wine. It consists of solid phase extraction (SPE) followed by multidimensional gas chromatography/mass spectrometry (MDGC/MS). It achieves low detection limits (<30 ng/l), minimises problems of contamination and shows high repeatability. In wine samples three fractions were differentiated: free extractable aldehydes, aldehydes bound in hydrophilic complexes and aldehydes bound in hydrophobic complexes. Analysis of 24 different wines suggested that these components are active contributors to the citrus fruit notes of some, but not all, white wines. http://dx.doi.org/10.1016/j.foodchem.2011.01.133

The impact of adding tannin to red wine

Tannins are an important part of wine quality and are frequently added during winemaking. Some winemakers add tannin to all products as a risk management strategy. Others add tannins to stabilise colour, to modify mouthfeel, to mask green characters or other faults, or to differentiate their wines from similar products, or a combination of these motivations. However, tannin

additives and their impact on wine are poorly documented. To characterize a range of oenological tannins and their contribution to wine quality, a tannin product at various concentrations was added to a Merlot wine during barrel ageing. Also, condensed and hydrolysable tannins were added to Cabernet Sauvignon wine post-pressing both at the recommended and at an excessive rate. It was found that adding tannin within the manufacturer guidelines adds significantly less tannin than would be supposed, and in some (maybe many) cases, probably less than is required to have a measurable impact. Adding very high levels of oenological tannins to wine so as to be able to measure an impact on the phenolic parameters had a subsequent negative effect on wine sensory character. The study concluded that many tannin additions may well be unjustified or unnecessary, and have limited or even negative impacts on quality. http://dx.doi.org/10.1016/j.foodchem.2011.09.101

Determination of total sulphur dioxide

The determination of total sulphur dioxide in foods and beverages is challenging for various reasons, including the instability of sulphur dioxide. Now a rapid distillation method coupled with ion chromatography has been developed and successfully applied to the determination of total sulphur dioxide in preserved foods, dried vegetables, vermicelli and 5 red wines. The distillation is performed using vapour and the carbon dioxide stream released from the reaction between sodium carbonate and sulphuric acid. The distilled product is captured in sodium hydroxide solution, and sulphur dioxide is measured as sulphite by ion chromatography. The distillation procedure was rapidly achieved within 3 min without blowing nitrogen or air. The method presents advantages of time-saving and simplification compared to conventional methods, and is already used as China National Standard Method. http://dx.doi.org/10.1016/j.foodchem.2011.09.086

Beer is also good for your heart

In previous studies evaluating whether different alcoholic beverages would protect against cardiovascular disease, a J-shaped relationship for increasing wine consumption and vascular risk was found, however a similar association for beer or spirits could not be established. Now an updated meta-analysis of studies involving a total of more than 200 000 people on the relationship between wine, beer or spirit consumption and vascular events has found evidence for a similar J-curve relationship between beer and vascular risk, and no such curve for spirits. 16 studies confirmed a J-shaped relationship between wine intake and vascular risk. A significant maximal protection was observed at 21 g/day of alcohol. Similarly, from 13 studies, a J-shaped relationship was apparent for beer with maximal protection at 43 g/day of alcohol. From 12 studies reporting separate data on wine or beer consumption, two closely overlapping dose–response curves were obtained with maximal protection at 25 g/day of alcohol. In 10 studies on spirit consumption and vascular risk, no J-shaped relationship could be found. This meta-analysis thus confirms the J-shaped association between wine consumption and vascular risk and provides, for the first time, evidence for a similar relationship between beer and vascular risk. The researchers speculate that the polyphenols, albeit different ones, in the wine and beer play a role in the protection offered against cardiovascular disease. http://dx.doi.org/10.1007/s10654-011-9631-0

Other News

International Organisation of Vine and Wine sets new green standards

The international wine trade has become one of the first industry sectors worldwide to agree on a consistent system to calculate carbon dioxide and greenhouse gas emissions. The system agreed by the International Organisation of Vine and Wine (OIV) allows all companies involved in the wine business to use a standard methodology to rate their own environmental performance. Called the Greenhouse Gas Accounting Protocol, the system has an Enterprise Protocol to help companies to assess the greenhouse gas emissions associated with their activities, and a Product Protocol, which offers guidance on emissions associated with vine and wine products. The Greenhouse Gas Protocol (www.ghgprotocol.org/about-ghgp) is the most widely used international accounting tool for government and business leaders to understand, quantify, and manage greenhouse gas emissions. www.decanter.com/news/wine-news/529499/oiv-sets-new-green-standards-for-wine-trade

Eye in the sky for small vineyards

An Australian team has fitted a German-made Oktokopter with monitoring devices to measure the levels of photosynthesis in vineyards. The remotely controlled unmanned aerial vehicle with eight rotors has full GPS, gyro and digital control, and provides a stable platform for remote cameras and scanners that can look beyond visible wavelengths into UV and infra-red spectrums. The scanning could be done by satellite but the infrequent passes overhead do not allow for regular monitoring, and the cost of using a manned aircraft is prohibitive for small vineyards. www.smh.com.au/executive-style/top-drop/spy-in-the-sky-can-eye-a-good-drop-20111105-1n104.html

Paper bottles on the way

GreenBottle is to launch the world's first paper wine bottle in the UK next year. The bottle features a similar plastic bag to that found in wine boxes so the drink is kept fresh. It weighs 55g, a 10th of the weight of a 550g glass bottle, so that transport costs will be significantly reduced. In addition, the compostable bottle's carbon footprint is 10% of that of a glass bottle. All that is necessary is to rip out the plastic lining and put the paper outer-casing in the bin or on the compost heap. GreenBottle already manufactures the world's first paper milk bottle, which is currently being tested in selected UK supermarkets. www.thedrinksbusiness.com/2011/11/world's-first-paper-wine-bottle-set-for-uk-launch/