



## Research News

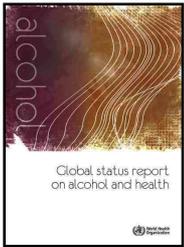
### Alternatives to methyl bromide for preplant control of nematodes

Plant parasitic nematodes (roundworms) can negatively affect grape production worldwide. For decades, soil fumigants have been used for the preplant control of such nematodes in Californian vineyards. The fumigant methyl bromide (MBr) has been widely preferred because of its broad pest-control spectrum and high nematode control efficacy. However, MBr is an ozone-depleting molecule and is being phased out. Six preplant fumigants and three nematode-resistant rootstocks were evaluated over an 8-year period as alternatives to MBr bromide in a vineyard replant situation. Two months after fumigation, Thompson Seedless (own roots), Merlot on 1103 Paulsen rootstock and Thompson Seedless on Freedom rootstock were planted.

The study found that 1,3-dichloropropene plus chloropicrin, iodomethane plus chloropicrin, and propargyl bromide all generally controlled root-knot (*Meloidogyne spp.*) and citrus (*Tylenchulus semipenetrans*) nematodes as well as did methyl bromide over an 8-year evaluation period. Sodium azide, metam sodium, and chloropicrin on its own were less effective. Root-knot nematodes in the Thompson Seedless on Freedom rootstock were unable to increase to high numbers even in the untreated control. The use of nematode-resistant rootstocks in replant situations where root-knot and citrus nematodes are a major problem is encouraged. The potential MBr alternatives may be very useful where no resistant rootstocks are available for the particular mixed nematode community infesting the field or where there is a history of new nematode pathogenicity that breaks down partial resistance. [www.ajevonline.org/cgi/content/abstract/62/1/42](http://www.ajevonline.org/cgi/content/abstract/62/1/42)

### WHO report on alcohol and health criticised

The World Health Organization (WHO) released its global status report on alcohol and health for 2011 in February. The International Scientific Forum on Alcohol Research (ISFAR) largely agreed with the discussion in the report on problems associated with the misuse of alcohol. However, it was disturbed that the report was limited almost exclusively to abusive drinking, was based primarily on out-dated information, and also suggested bias against alcohol. The report ignored a massive amount of scientific data indicating that in all developed countries, moderate consumers of alcohol are at much lower risk of essentially all of the diseases of ageing, viz. coronary heart disease, ischemic stroke, diabetes, dementia, and osteoporosis. And conspicuously absent from the WHO report is a description of the decrease in total mortality among middle-aged and elderly people associated with moderate alcohol consumption, a consistent finding throughout the world.



Epidemiologic studies over many decades have shown that moderate drinking is associated with lower risk of cardiovascular disease and other diseases of ageing. And a very large number of experimental studies, including results from human trials, have described biological mechanisms for the protective effects of both alcohol and the polyphenolic components of wine. A number of comprehensive meta-analyses are cited by Forum reviewers which they consider to provide much more accurate, up to date, and scientifically balanced views of the current status of the health effects of alcohol consumption. Such documents are better sources of data upon which policy decisions should be based, than is the WHO report. [www.bu.edu/alcohol-forum/critique-047-overall-health-effects-of-alcohol-consumption-comments-on-a-who-report-10-july-2011/](http://www.bu.edu/alcohol-forum/critique-047-overall-health-effects-of-alcohol-consumption-comments-on-a-who-report-10-july-2011/)

### The effect of low amounts of red wine on the ventricles of the heart

In the human heart there are two ventricles. The right ventricle (RV) pumps blood into pulmonary circulation for the lungs, and the left ventricle (LV) pumps blood into the body through the aorta. While moderate-to-high blood concentrations of alcohol acutely impair (LV) performance, the effects of low concentrations have up to now been unclear. A study of 64 healthy volunteers (35 men, 29 women) in their twenties, drank 0.5 ml per kg of body mass of Italian red wine (about 25ml to 100ml in total and equivalent to 0.5 mg of alcohol per kg of body mass). The results showed that low doses of red wine are associated with acute depression in LV function and acute increase in RV function. These findings point out the importance of considering even low doses of alcohol as a socially relevant cause of acute cardiac toxicity because light alcohol intoxication represents a very common occurrence worldwide. <http://dx.doi.org/10.1111/j.1530-0277.2011.01530.x>

### Adapting to climate change in the premium winegrape growing regions of the western United States

Most US wines come from the West Coast, with California alone producing more than 5 million gallons per year, accounting for about 90% of the US total wine production. A study examined how global warming could affect growing conditions in four premium wine-producing West Coast areas by 2040. These were Napa and Santa Barbara in California, Yamhill County in Oregon, and Walla Walla County in Washington State. Premium wines were defined as the 25% percent most expensive wines on the market. The study assumed that there would be a 23% increase in atmospheric greenhouse gases by 2040, raising the average global temperature by about 1°C, a conservative scenario.

The study examined effective climate change adaptation activities. The damage avoided by each adaptation activity creates an 'adaptation wedge' relative to the loss that would occur without that adaptation activity. The projected warming results in a 50% loss of suitable winegrape area throughout much of California. However, in quantifying adaptation wedges for individual high-value counties, it was found that a large 'adaptation wedge' can be captured by increasing the severe heat tolerance of the vines, which eliminated the 50% loss projected by the end of the 2030–9 period in the North Coast region, and reduced the projected area loss in the Central Coast region from 30% to less than 15%. Increased severe heat tolerance can capture an even larger 'adaptation wedge' in the Pacific Northwest, including conversion of a projected area loss of more than 30% in the Columbia Valley region of Washington to a projected gain of more than 150%. The warming has the potential to alter the quality of winegrapes produced in the western US, and potential actions to create adaptation wedges using these potential changes are discussed. <http://dx.doi.org/10.1088/1748-9326/6/2/024024>

## Local Research News

### The potential impact of climate change on grapevine diseases in South Africa

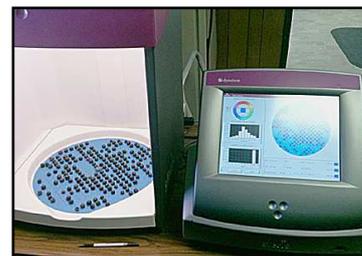
An investigation into the potential impact of climate change on grapevine diseases of economic importance to South Africa has compiled a list of environmental conditions favouring all major grapevine diseases. The list comprises the major grapevine fungal soilborne and trunk diseases, the major grapevine foliar diseases, the major grapevine viral and bacterial diseases, and vectors of major grapevine diseases. The investigation also undertook two literature studies. These were a review of current, new and future grape growing areas of South Africa, and the potential effect of climate change on wine regions of South Africa. It is forecast that the annual temperature in South Africa will increase by 1 to 4°C by 2050 and by 3 to 5°C by 2100. With this increase, chilling units will also reduce by at least a further 25%. A chilling unit is one hour's exposure to the chilling temperature, which is a low temperature between freezing point and about 7 to 16°C. Healthy dormancy is triggered by exposure to chilling temperatures. Lack of such exposure results in delayed and substandard foliation, flowering and fruiting.

The crops most vulnerable in southern Africa will be those dependent on rainfall, especially in the more arid western regions, and those which require significant chill units, where these are already marginal. In this situation viticulture will be under severe pressure. With temperature increases plants will grow faster, and will start growing earlier, and so will reach fruit maturity earlier. With an increase in plant biomass due to higher CO<sub>2</sub> levels, grapevines will grow much more dense canopies, possibly leading to more severe disease infections because of longer leaf wetness periods. This will bring on more severe downy mildew, bunch rot and Phomopsis ('streepvlek') infections. With more shading and thus less UV light penetration into the canopy, there will be higher incidences of powdery mildew infections. Botrytis bunch rot will also increase, especially in the warmer regions.

As new areas are developed for viticulture as a result of climate change, pests and diseases will also extend their ranges into these newly developed areas. With the rise in ambient temperature during winter insect pests that had been killed by the colds could survive and thrive. An increase in temperature could also have a negative effect on parasites and predators which thus could have a negative effect on natural insect control. Argentine ants are forecast to become more invasive in the 'Mediterranean' parts of southern Africa, which include the vineyards of the Western Cape. Grapevine mealybugs will have more life cycles in winter. [www.sawislibrary.co.za/dbtextimages/Winetech2010\\_11.pdf](http://www.sawislibrary.co.za/dbtextimages/Winetech2010_11.pdf)

### Berry colour evolution used to forecast a harvest date for Sauvignon blanc

Wine grape producers need to characterise and monitor ripening to determine the optimal harvest date for a specific style of wine. Methods for selecting this date include classical biochemical indicators (Brix, titratable acidity, pH) and berry tasting. It is, however, generally difficult to establish accurate relationships between these indicators and the desired style of wine in terms of wine aromatic profile. Using photogrammetry and proprietary software, the Dyostem (right) measures volume, colour, heterogeneity and the quantity of sugar contained in individual berries. The sugar content measurement is a newly established indicator distinguishing ripening from maturity. According to the evolution of the berry hue with time, the method is used to forecast the style of wine.



A pilot project evaluated the use of the Dyostem for determining the potential of the harvest, and for selecting a harvest date according to berry potential, specifically integrating the aroma profile (berry potential according to the desired style of wine). The project compared two different climatic regions, Overberg and Stellenbosch, according to the rate of Sauvignon blanc berry ripening using the new Dyostem indicators in conjunction with classical maturity indices. The tempo of colour evolution was more regular for berries from the Overberg region. Berries from the cooler Overberg region never attained the yellow colour of berries from Stellenbosch. Harvests were carried out at three different periods, for both vineyards, according to the Dyostem tint angle values and six mini-fermentations in total were performed. No direct relationship was found between brix<sup>o</sup> and berry colour evolution. Berry colour evolution (versus the tint angle) reading by Dyostem, was related indirectly to the style of wine. This study was the first calibration of the Dyostem in South Africa. [www.sawislibrary.co.za/dbtextimages/Winetech2010\\_02.pdf](http://www.sawislibrary.co.za/dbtextimages/Winetech2010_02.pdf)

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