



Research News

Listening to vineyard pests

The Grape Root Borer (*Vitacea polistiformis*) is a moth that looks like a wasp. It is found throughout the midwest of the United States, and is the most serious threat to grapes in Florida. The eggs hatch on the surface and the larvae (below) tunnel into the root system of their host plant. The damage affects vine growth, and reduces leaf and berry size. There are only two ways of dealing with the pest. One is by spraying with chlorpyrifos, which is effective, but it is toxic to birds, fish and bees, and is environmentally unfriendly. The other technique is 'mounding'. Grape Root Borer caterpillars form their cocoon while still submerged. When they become adult moths, they break free from the cocoon and emerge from the soil. Placing a mound of soil around the base of the grapevine means the insects must travel farther as fragile adults before they reach the surface, and it generally kills them. But piling up mounds of soil throughout a vineyard is time consuming and labour intensive.



The subterranean larvae produce spectrally distinctive sound impulses during movement and feeding activities. Researchers used portable accelerometer amplifiers (effectively microphones) to detect the impulses. A 30 cm nail was inserted into the root system of the selected vine and the accelerometer was attached to it by a magnet. Impulses can be identified and recognized as insect-produced sounds by most listeners after 10 to 20 minutes of practice. Both human listeners and computer software were able to predict the presence or absence of infestation at statistically significant levels based upon spectral profile and temporal pattern analysis. However, human listeners were more likely to overestimate the presence of infestation, whereas the computer was more likely to underestimate infestation. It was recommended that until the software is further refined, a human listener should assess the likelihood of infestation for pest management decisions. Mounding of only the infected vines identified by this method lowers labour costs significantly. www.fcla.edu/FlaEnt/fe94p296.pdf

Alcohol consumption and body weight

A review was conducted to analyze the effects of alcohol consumption on body weight. Using the Medline database from 1984 to March 2010, thirty-one publications were selected for analysis on the basis of relevance and quality. The overall results did not conclusively confirm a positive association between alcohol consumption and weight gain. However, since positive associations between alcohol and weight gain were mainly found in studies with data on higher levels of drinking, it is possible that an effect on weight gain or abdominal adiposity may only be experienced by heavy drinkers (2–3 drinks per day). Moreover, light-to-moderate alcohol intake, especially of wine, may be more likely to protect against, rather than promote, weight gain, whereas intake of spirits has been positively associated with weight gain. Thus the type of alcoholic beverage might play an important role in modifying the effect of alcohol consumption on weight gain. <http://dx.doi.org/10.1111/j.1753-4887.2011.00403.x>

Alcohol in moderation leads to successful ageing

The Nurses' Health Studies in the US are among the largest and longest running investigations of factors that influence women's health. Started in 1976, the information provided by the 238 000 participants has led to many insights on health and disease. Now the NHS has been used to examine alcohol consumption at midlife and 'successful ageing' in 13 894 women who survived to age 70 or older. 'Successful ageing' was considered as being free of 11 major chronic diseases and having no major cognitive impairment, physical impairment or mental health limitations. Analyses were restricted to the participants who were not heavier drinkers (>45 g/d (grams per day)) at midlife.

Of all eligible study participants, 1 491 (10.7%) achieved successful ageing. For these it was found that light-to-moderate alcohol consumption at midlife was associated with modestly increased odds of successful ageing. The odds ratios (and 95% confidence interval) were 1.0 (referent) for nondrinkers, 1.11 (0.96–1.29) for ≤ 5.0 g/d, 1.19 (1.01–1.40) for 5.1–15.0 g/d, 1.28 (1.03–1.58) for 15.1–30.0 g/d, and 1.24 (0.87–1.76) for 30.1–45.0 g/d. Meanwhile, independent of total alcohol intake, participants who drank alcohol at regular patterns throughout the week, rather than on a single occasion, had somewhat better odds of successful ageing. The odds ratios (and 95% confidence interval) were 1.29 (1.01–1.64) and 1.47 (1.14–1.90) for those drinking 3–4 days and 5–7 days per week in comparison with nondrinkers, whereas the odds ratio was 1.10 (0.94–1.30) for those drinking only 1–2 days per week. These data suggest that regular, moderate consumption of alcohol at midlife may be related to a modest increase in overall health status among women who survive to older ages. <http://dx.doi.org/10.1371/journal.pmed.1001090>

Simple test for sulphur depends on antacid tablet

The legendary effervescent antacid and pain reliever, Alka-Seltzer has been the subject of songs and even an experiment performed in space. Now a PhD student has developed a low cost method that allows growers and winemakers to measure

the level of sulphur residues on grapes using the tablet. Sulphur is the material of choice to control powdery mildew because it's cheap, effective and certified for organic production. However, growers need to know how close to harvest they can spray sulphur-based fungicides without affecting wine quality. With no real data on how long the residues persist, there is a tendency towards conservatism in sulphur use. The new method relies on converting elemental sulphur into the more easily measured hydrogen sulfide gas. The final hurdle was devising a way to remove all oxygen from the flask and flush the hydrogen sulfide into a detection tube. Adding the Alka-Seltzer generates carbon dioxide (CO₂) gas which clears the oxygen, it buffers the solution at the ideal pH for the reaction, and the CO₂ pushes the newly formed hydrogen sulfide gas into the detection tube. The test takes half an hour to perform, the equipment costs \$50, and the consumables cost \$5 per analysis. It could save growers thousands of dollars in sulphur application costs. www.news.cornell.edu/stories/Sept11/Alka-Seltzer.html



Local Research News

The detection of rupestris stem pitting virus

Grapevine rupestris stem pitting – associated virus (GRSPaV) is commonly thought to be the causal agent of Shiraz decline disorder in vineyards. Symptoms of this graft transmissible disorder include abnormal graft unions, premature leaf reddening and deep grooving of the stems of scions. Affected vines have reduced vigour with yields of fruit and quality of wine drastically reduced. The disorder normally leads to death in the grafted plant in approximately 3-6 years which means that entire vineyards must be replaced. A study to reliably and rapidly detect GRSPaV in grapevine in South Africa achieved this by using crude plant extracts in both quantitative and conventional reverse transcription polymerase chain reaction (RT-PCR). The feasibility of total RNA extracts for RT-PCR template was evaluated. This template was found to be adequate, provided that more than one primer set was used.

The study also succeeded in establishing and optimizing a technique to detect GRSPaV sequence variants in South African vines. This was nested quantitative polymerase chain reaction and high resolution melting assays (qPCR-HRM) which was validated by direct sequencing of samples. The technique is not sequence-specific and is capable of differentiating the various GRSPaV sequence variants. Genotypes could be assigned to certain groups of samples and were phylogenetically correlated to published sequences. Phylogenetic analyses revealed that the major sequence variants of GRSPaV found in South African vines belong to Groups II and III. Mixed infection of sequence variants and quasi-species were a common occurrence. www.sawislibrary.co.za/dbtextimages/Winetech2010_03.pdf

Are fruit trees bad for grapevines?

Grapevines are often grown in close proximity to stone fruits (several *Prunus* species) or pome fruits such as apples and pears. A study examined stone and pome fruits inhabited by known grapevine trunk disease pathogens so as to determine whether such trees should be considered as alternative hosts of these pathogens. Living wood of *Prunus*, *Malus* and *Pyrus* spp. with dieback, canker or necrotic symptoms as well as pruning debris was sampled in the Western Cape and Limpopo Province (only *Prunus* spp.). Fungi from the samples were isolated and morphologically and phylogenetically characterised. A number of fungi which have been reported to be pathogenic on grapevine were isolated from the wood of *Prunus* spp. Fungi were identified from apple and pear dieback symptoms which are known to be involved in grapevine decline diseases. Apart from the known fungal taxa, two new fungal genera and 24 new species were found and described. The study concluded that pome and stone fruit orchards should be considered as potential inoculum sources of grapevine trunk disease pathogens. www.sawislibrary.co.za/dbtextimages/Winetech2010_13.pdf

Other News

A marketplace for scientific research

If you want some research done, then you can visit the website of newly established Science Exchange <http://scienceexchange.com> and 'service providers' will submit bids to do the work. The goal is to make scientific research more efficient by making it easy for researchers to access experimental expertise from facilities with underutilized capacity. Prices can vary dramatically, for example, bids for a microRNA study ranged from \$3 500 to \$9 000. Science Exchange takes a commission of 5% for projects under \$5 000, and a lower commission on a sliding scale for projects costing more than \$5 000.

Art affects wine taste

A study has found that wine labels can influence how wine tastes to consumers. At a bar, for some customers, the bartender had been coached to comment that the bottle labels featured paintings by Renoir. People who tasted these wines judged them all favourably. For others, the bartender mentioned that the same wine label paintings depicted people. The patrons still judged the wine favourably if the label featured what seemed like an appropriate image for a wine label. But the same wine in a bottle labelled with an out-of-place image, was received less favourably. The researchers concluded that art causes wine to taste good, but only as long as it retains its status as art. <http://psp.sagepub.com/content/early/2011/07/31/0146167211415631>

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