



## **New project 2017: Wireless sensor network for smart vineyard monitoring and management**

*Researcher: R Wolhuter*

Efficient farming is not possible without relevant and up to date information regarding plant stress, imminent disease, soil conditions and many others. Current data acquisition techniques are relatively expensive and tend to be substantially static in deployment. Adaptation to different applications is generally also time consuming and frequently impractical.

This project aims to develop the practical deployment and evaluation of an advanced, self-configuring wireless sensor network (WSN) to support advanced viticultural monitoring and management techniques. A cost effective, flexible, rapidly deployable monitoring network that can deliver fast and reliable plant and crop information will be of great value to precision farming. The system is intended to provide real time, distributed, frequently updated parameter values, at many freely selected locations. This data could be used to monitor a range of plant, soil and environmental conditions to inter alia provide input into irrigation and disease control strategies. It might also be possible to indicate automatic identification of plant health and crop condition by application of machine learning techniques.

## **New project 2017: Effect of grapevine leafroll disease on grape composition and wine quality**

*Researcher: J Burger and EH Blancquart*

It is generally accepted that Grapevine Leafroll Disease (GLD) has a negative impact on fruit composition and ultimately wine quality. Anecdotal evidence exists on the impact of GLD on grapevine physiology. The extent of the impact remains elusive, as there is great variation and even conflicting reports worldwide. This project is a pilot study to a larger long-term project that will investigate the effects of GLRaV-3, as the main agent of GLD, under controlled conditions. The pilot project will evaluate GLD for its impact on grapevine physiology, fruit development and wine quality (phenolic, colour and aroma composition), under South African conditions. Four commercial wine cultivars (Cabernet Sauvignon, Merlot, Pinotage and Chardonnay) will be included in the study.

The information generated will be useful to wine producers to make strategic decisions regarding the management of GLD's effects on the vine, fruit and wine quality. It will also aid in determining the economic impact of GLD within their own setting.

## New project 2017: A study to determine the interaction of GLRaV-3 and GVA during transmission

Researcher: AEC Jooste

A recent study showed that Vitiviruses, including GVA, GVF and GVE, were detected in combination with GLRaV-3 (leafroll) in South African vineyards. Little is known about the interactions between these virus species within a host or during insect transmission. Past research indicated that GVA might require the presence of another virus, i.e. GLRaV-3, for transmission. In a recent mealybug transmission experiment GVA was transmitted on its own to healthy Cabernet franc recipient plants from source plants infected with both GLRaV-3 and GVA. This study will test, in a controlled environment, if GVA requires GLRaV-3 for transmission by the mealybug vector. Understanding transmission properties has implications for managing disease spread in vineyards.

## Final report: Wine Quality Control: Screening of regulated substances

Researchers: A Buica and M Stander

### Project aims:

- 1 – Establish a robust and fast routine screening method for regulated substances (sorbic acid, ochratoxin A, natamycin);
- 2 - Establish robust and fast routine methods for high risk substances (biogenic amines, phthalates, colourants)

### Project layout:

1. Method development for the sample preparation for target compounds (biogenic amines)
2. Method optimisation for the LC-MS conditions for the analysis of the target compounds in terms of speed of analysis and robustness
3. Method validation for both sample preparation and instrumental analysis to prove their selectivity, accuracy and robustness
4. Method development and optimisation for other target compounds (sorbic acid, ochratoxin, natamycin, etc.)
5. Implementation: Screening of samples (young wines and from previous vintages)

### Results:

Various methods have been developed or adapted to include a larger number of compounds of interest. Natamycin and sorbic acid are now included in one single LC-MS/MS analysis instead of two.

### Significance of the study:

These optimised methods as well as the measurement of biogenic amines are now available to industry via Stellenbosch University's Central Analytical Facility (CAF).

[Final Report](#)

# Latest international research

## Does subsurface irrigation result in water use savings?

*Researcher: M. McCarthy*

The aim of this five year field experiment done by SARDI in Riverland, Australia, was to determine whether subsurface irrigation resulted in any water use savings and improved rootzone salinity.

Three types of irrigation were installed: standard drip irrigation, subsurface drip and subsurface drip within a porous fabric cover designed to increase the lateral movement of water away from the emitter. Four irrigation treatments were established, resulting in applications of 50%, 67% and 84% of the standard irrigation (100%) used in the remainder of the block of Chardonnay grapevines. The vineyard was planted on to Ramsey rootstock in 2004. The soil type varied from sandy to loamy sand across the trial site. Across the seasons, the yield of subsurface irrigated vines was significantly lower than standard drip or fabric covered subsurface, which delivered similar yields.

In conclusion, this long term field experiment demonstrated that:

- under non-restricted irrigation allocations there was no water use savings or improved root zone salinity with the use of subsurface irrigation.
- Subsurface irrigation resulted in the highest overall rootzone salinity for the four years of data. The lower yield of subsurface irrigated vines may have been in part due to higher rootzone salinity.
- Only under severely reduced irrigation volume i.e. where the drip irrigation was reduced by 50%, there was some yield advantage with the two types of subsurface irrigation.

[Read more](#)

The South African Society for Enology and Viticulture will be celebrating the 40 year existence of the Society by hosting a celebratory 2017 conference between 29 and 31 August 2017 at Allée Bleue, Simondium.

Please register on or before 21 August 2017.

[Click](#) to download the Conference Programme and Registration Form.