LEAFROLL CONTROL STRATEGY

6. EFFECTS OF THE DISEASE

6.1 Rate of infection in South Africa

Leafroll disease spread is rapid within the industry. When leafroll infected grapevines are not managed properly, the infection levels increase exponentially for the first few years with an average year-on-year increase of 1.94 times. This means that the number of leafroll infected grapevines will almost double each year.

6.2 Yield losses

Reduced yields are common in grapevines infected with leafroll disease when compared to healthy grapevines. This reduction in yield has been attributed to smaller, uneven bunches with fewer and smaller berries on grapevines infected with leafroll disease compared to larger, even bunches with more and larger berries on healthy grapevines. Reduction in grapevine yield increases as the severity of the infection in vineyards increase. Systematic annual decreases in grapevine yield have a cumulative effect of yield losses over the lifespan of a particular vineyard.

6.3 Quality losses

Leafroll infected grapevines experience a delay in fruit ripening and uneven fruit maturity compared to healthy grapevines.

Decreases in sugar accumulation and increases in titratable acidity are common where grapevines are infected with leafroll disease compared to healthy grapevines.

Grapevines infected with leafroll shows poor colour development as a result of reduced anthocyanin concentrations in the pigments of berry skins compared to healthy grapevines.

As a result of the abovementioned fruit quality alterations, a reduction in wine quality is expected.

6.4 Distribution in South Africa

Grapevine leafroll virus is present in all of the wine producing regions in South Africa and vineyards older than 15 years are generally 100 % infected. However, the extent to which the infection is present in the different regions is not quantified. This is dependent on various factors of which vineyard age is most likely the main factor.

6.5 Cost

The replacement of highly infected vineyards every 15 to 20 years as a result of poor yields and lowered grape quality, carries a huge cost. Healthy vineyards should theoretically experience a much longer productive lifespan.

Rootstock cultivars don't show visual leafroll symptoms and can't be tested for leafroll disease, thus the possibility of transmitting leafroll through the graft union remains. This could lead to expensive nuclear and mother block establishment blocks not being useful for propagation material.

Expensive tests (ELISA) have to be used to test white cultivar grapevines for leafroll disease compared to identifying leafroll on visual symptoms as in the case of red grape cultivars.

Certain viruses associated with leafroll disease (e.g. GLRaV-2) are associated with graft union incompatibility and grapevine decline over time leading to grapevine death. If undetected by visual inspection and/or testing, production of more propagation material is needed to compensate for losses as a result of affinity problems.

This research was funded by

WINETECH

Department of Viticulture and Oenology, Stellenbosch University
Author: Prof Gerhard Pietersen, University of Pretoria / ARC-PPRI