Dilute spraying and under dosing

On many occasions, I come across growers who think they are spraying at the correct chemical rate for dilute spraying, but on further investigation with an in-vineyard test, they are under dosing. I find under application of dilute spray volumes of 10 to 20 per cent is common and in extreme cases, it can be as high as 40 per cent. Less than required spray volumes and resultant under dosing of chemical has clear implications for product performance and resistance development.

Dilute volume spraying is where the vine canopy is thoroughly wet to the point of run off. The volume required to reach this point will depend on the canopy size, which changes with vineyard setup and as the season progresses.

My first recommendation is that growers review their canopy size at three stages of seasonal growth and compare their dilute volume decisions against the APVMA recommendations (See Indicative water volumes for dilute spraying grapevines). If there is a significant variation, you should look to do some in vineyard spray trials to determine your correct rate. Spray volume really is the key in determining the amount of chemical that should be applied to a vine canopy to deposit a correct label dose.

INDICATIVE WATER VOLUMES FOR DILUTE SPRAYING GRAPEVINES

SPRAWL CANOPY				
Indicative volume L/100 m	10 to 20	20 to 40	40 to 60	60 to 90
Indicative volume L/ha	300 to 600	650 to 1,300	1,600 to 2,000	2,300 to 3,000
VSP CANOPY				
Indicative volume L/100 m	10 to 20	20 to 40	30 to 45	45 to 75
Indicative volume L/ha	300 to 600	650 to 1,300	1,600 to 1,500	1,500 to 2,500

Diagram source: Radure, I. (Ed.) New label directions for spraying – A review of experiences over the past year.

Because every vineyard is different, in-field measurements and observations will most likely deliver the most reliable and accurate results. Your own spray tests are an ideal way to gain the experience you need and it's not as hard as you may think.

Simply run a series of tests where you increase or decrease the spray volume until a point is reached where you consider the spray liquid covers all parts of the canopy to the point of run off. Your local spray expert may be able to help you with this.

Of course, it's easy to see when water is at the point of runoff on the outer canopy. Assessing the point of runoff inside the canopy is more difficult. Water and oil-sensitive paper (WSP) is a fantastic resource that has been available to spray operators for many years. The WSP card has a special coating that produces a stain when a droplet lands on it. Put these throughout the canopy to make sure spray droplets cover all parts of the canopy as evenly as possible. If a wetting agent is to be used for spraying, then it should be added to the water before you run your tests.

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Sooty mould

During the 2017 vintage, some wine-grape growers in several regions were severely affected by 'sooty mould'. The thresholds for the presence of all moulds at which some wine producers downgrade or reject fruit is 3%, which means that there is potential for sooty mould to cause significant economic losses to grapegrowers. In addition, any effects of sooty mould on the composition and sensory qualities of wine are not well understood. This column provides answers to some common questions about sooty mould.

What does sooty mould look like?

Sooty mould refers to a fungal infection, where all parts of the vine, including the grapes, can become blackened, as though they are covered with a layer of soot.

What causes sooty mould to develop?

The fungus Capnodium has been identified as a cause of sooty mould, although a range of other fungi that are commonly found on healthy grapes might also be involved. The fungi rapidly increase when they colonise areas of the vine where 'honeydew' has been excreted by sap-sucking insects such as scale and mealybug. Honeydew is a translucent, sticky substance, derived from the sap of the vines. It has been reported that the sap-sucking insects remove mainly nitrogenous compounds from the sap, and excrete most of the carbohydrates as honeydew. The severe outbreaks of sooty mould in 2017 appear to have been primarily caused by high numbers of scale.

Although many affected growers report that scale are present in their vineyards to some extent every year, it is not known why their numbers were high in 2017. It is possible that particularly high spring and early-summer rainfall in most of the badly affected regions, coupled with lower than average temperatures and the absence of periods of extreme heat during the same period, contributed to the high scale populations. However, even in the most badly affected regions, the presence of sooty mould appears to have been somewhat localised and sporadic, both between vineyards, and even between blocks within the same vineyard.

What is the potential for sooty mould to also be a problem during the 2017/2018 season?

Because the primary cause of the sooty mould seen in 2017 was high populations of scale, the starting populations of scale for the next growing season are likely to be higher than usual. Therefore, if measures are not taken to reduce scale numbers, there may be the potential for sooty mould to increase during the next, and subsequent, growing seasons. Where economic losses were significant last season, spraying of target areas with products approved by the relevant grape purchaser is recommended.

What is the impact of sooty mould on wine quality and processing?

A small-scale winemaking trial was conducted using Shiraz grapes from the 2017 harvest, with three treatments: an unaffected control, grapes with 5% sooty mound and grapes with 25% sooty mould. The grape bunches were individually assessed for the incidence of sooty mould, and bunches containing any other possible moulds or insect damage were eliminated.

Analytically, little difference was seen between the control wine and the 5% and 25% sooty mould-affected wines, and during sensory difference testing, an experienced tasting panel could not distinguish between the control and the 25% sooty mould-affected wine. Larger, one-tonne scale trials were also conducted at a commercial winery using Chardonnay and Shiraz, and similar results were obtained.

In terms of any impacts on wine processing, at crushing, more colour was evident in the sooty mould-affected must. This might imply that the sooty mould had to some extent infiltrated the grape skins, resulting in greater fragmentation of the skins during destemming and crushing. The ferments containing sooty mould were later found to contain up to 10% extra lees compared to the controls, which might logically be due to the presence of additional grape solids.

When interpreting the results of these winemaking trials, however, it should be noted that commonly when sooty mould is present, other microorganisms might also have proliferated, which alone, or in combination with the sooty mould, could have a negative effect on wine quality. In addition, it is possible that any small differences which may exist between the trial wines at the time of writing might become more evident with time, and this will be assessed with future tastings.

What are the relationships between scale numbers, the incidence of sooty mould, and vineyard management practices?

Vineyard surveys are being conducted to ascertain any correlations between scale numbers and incidence of sooty mould and vineyard management practices. This work involves interviews with affected and unaffected growers, and collation of spray diary data from up to five years.

What options are there for treating vineyards for scale and mealybug?

Mineral oil sprays during vine dormancy have been the conventional means of controlling scale, however, the success of such sprays is reported to vary widely across regions. Getting contact with the insects can be problematic because they overwinter under the vine bark, requiring a thorough drenching of the trunk, cordon and spurs when the spray is applied. The active constituent spirotetramat is recommended for suppression of scale up to growth stage E-L 18 for export wine, and three organophosphate insecticides are registered for scale, but due to their broad-spectrum action, they are not recommended.

In recent years, trials to control scale have been conducted with a range of insecticides registered for use in wine-grapes, with varying levels of success. A list of products is published in the AWRI 'Dog book'. Clothianidin will undergo further trials for scale control and residue evaluation next season, but is currently only registered for mealybug control, and should not be used without first consulting the AWRI or the relevant grape purchaser.

Integrated Pest Management (IPM) principles should be considered when seeking to control scale or mealybug, as any insecticides that adversely impact predatory arthropods and parasitoids, such as cryptoleamus and green lacewings, are likely to exacerbate mealybug, scale and sooty mould problems. The provision of habitat for such beneficial insects within vineyards should also be considered as part of an IPM approach.

For further information see:

Managing scale in vineyards, Jenny Venus. AWRI webinar: https://www.youtube.com/watch?v=6-5Y6wzHXnE

For specific queries or technical support, please contact the AWRI helpdesk at helpdesk@awri.com.au or on 08 8313 6600.

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Partnership for two industry bodies

The Australian Wine Research Institute (AWRI) and Wine Australia have entered into an eight year agreement covering research, development and extension (RDE) activities at the AWRI from 2017–2025.

This long-term partnership reflects a high level of strategic alignment between the two organisations. It provides the AWRI with greater certainty and flexibility and will allow it to plan and deliver RDE more efficiently for the benefit of levy payers and the broader community.

Key grape and wine sector priorities that will be addressed under this agreement include:

- Improvements in wine production efficiency
- Improved tools for the creation of target wine styles and strategies to mitigate faults
- Increased understanding of wine flavour and texture and how they are influenced by viticultural and winemaking inputs
- Enhanced yeast and bacterial germplasm options
- Improved fermentation processes
- Greater understanding of terroir in an Australian context
- Continued support for market access for Australian wine
- Extension activities that support producers and facilitate awareness and adoption of research outcomes.

New RDE funding framework

This agreement is the first of a series of bilateral partnerships between Wine Australia and major research institutions under a new RDE funding framework.

"We want to ensure that in areas of high priority, we give researchers with proven expertise the resources to undertake research in the areas that will deliver the most benefit to the grape and wine sector. Regular interaction, reporting and review points will ensure ongoing alignment with grape and wine sector priorities," said Clark.

"It is not surprising that our first partnership is with the AWRI. Its expertise and commitment has been central to establishing Australia's reputation as a research leader, and this will continue."

Under the new RDE funding framework, Wine Australia will also retain the capacity to support additional projects through competitive calls.