The Australian Wine Research Institute

Fact Sheet
VITICULTURE

Scale – factors influencing their prevalence and control

Introduction

Scale insects are common in Australian vineyards, yet in most cases they do not cause significant economic losses and intervention is not required. In some instances, however, more major outbreaks occur, and these infestations require management to avoid grapes being downgraded. This fact sheet explores the factors that influence scale numbers and describes the chemical control options available to manage them when an outbreak has occurred. Because scale insects are not considered a major pest, the factors causing sporadic outbreaks are not well understood. Information about the scale species found in vineyards and their life cycle can be found in the AWRI fact sheet *Scale – insect pests of vineyards*.

Weather conditions

Seasonal weather conditions may play a role in scale numbers in the vineyard, but this has not been the subject of detailed research. Changes in climate may be having an impact, with higher scale numbers favoured when milder conditions are experienced at critical growth stages such as in winter and during egg production.

Grapevine varieties

Grapevine varieties appear to vary in their susceptibility to scale. Chardonnay can be severely affected, where Pinot Noir tends not to be. It is thought that Pinot Noir vines lose leaves when scale is present, eliminating the problem.

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Natural enemies

There are many natural enemies of scale found in Australian vineyards, including parasitic wasps, beetles, predatory moth larvae, lacewings and a predatory mite. A healthy population of these predators and parasitoids can prevent scale from reaching epidemic proportions. Actions that favour a healthy predator population include providing a habitat for their food and shelter and minimising the use of pesticides known to be toxic to beneficial insects.

Poorly timed and/or widespread use of broad-spectrum insecticides can disrupt ecosystem balance, but some beneficial insects can also be susceptible to the use of some commonly used fungicides such as mancozeb and sulfur.

Examples of beneficial insects in the vineyard – green lacewing adult (left) and larvae (right). Photos courtesy: Mary Retallack.

Chemical control options

When scale numbers are high or sooty mould has caused an economic loss in the previous season, it may be necessary to use pesticides to bring the scale numbers under control. Table 1 lists the active constituents registered for scale control or suppression.

To minimise disruption to the beneficial insects present in the vineyard, a chemical application that targets areas where a scale problem was noted in the previous season is preferable to a whole of vineyard approach. It is recommended to apply targeted sprays during dormancy using active constituents that are least toxic to beneficial insects.

The use of winter or summer mineral oil during vine dormancy is likely to have the least impact on beneficial insects. Spot-spraying areas where scale was observed last season is preferred to broad-scale applications. The oil must smother the scale and requires thorough coverage of the cordon and canes. This is best achieved after pruning and if possible should be applied when scale are moving from under bark. As the oil is toxic to green tissue, it should not be used after growth stage E-L 2, when bud scales start to open.

If monitoring indicates that the oil spray was not able to adequately control the population, a suppression agent may be required. Spriotetramat is registered for suppression of scale only and is not expected to provide a high level of control where scale infestation is severe. Used in a program that includes a dormancy spray with mineral oil, Spriotetramat may be sufficient to control the problem without the use of broad-spectrum insecticides.

If monitoring indicates that the mineral oil + Spriotetramat combination has not achieved sufficient scale control, three broad spectrum insecticides are registered for use. It is recommended that growers use these insecticides as targeted sprays and seek approval from their winery or grape purchaser before use.

Table 1: Active constituents registered for use against scale insects in Australia, the label and export wine withholding period (WHP) and comments on their use. Growers should always follow label directions and contact their winery/grape purchaser to find out if they have any specific chemical recommendations.

Active constituent	Label withholding period (WHP)	WHP for export wine	Comments
Paraffinic oil Petroleum oil	Dormancy application	Dormancy application	Summer and winter oils are toxic to green tissue on vines and should only applied during full dormancy. They work by suffocating the scale, so thorough coverage of the crown, cordons and spurs provides the best results.
Spirotetramat (suppression only)	4 weeks before harvest	E-L 18, 14 leaves separated; flower caps still in place, but cap colour fading from green	Monitor crops following budburst and commence applications at the onset of crawler emergence. Foliage is required to take up the chemical so do not apply prior to E-L 13. Continue to monitor crops and apply a second application 21 to 28 days later if necessary.
Broad-spectrum insecticides: * chlorpyrifos * maldison/malathion * methidathion	 2 weeks before harvest 3 days before harvest 2 weeks before harvest	Contact your winery/grape purchaser prior to application. Use no later than 80% capfall.	Some chlorpyrifos products are registered for use at lower rates when mixed with winter oils and applied during full dormancy. Spot-spray where possible to minimise the impact on other species. Time sprays to coincide with scale emergence if beneficial insect numbers are low.

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References and further reading

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