



## Scale – insect pests of vineyards



### Introduction

Scale insects are sap-sucking pests that draw nutrients from plants and excrete a sugary liquid called honeydew. These insects are common in Australian vineyards but typically do not cause enough damage to warrant action to control them. In some circumstances, however, the population can reach a threshold where intervention is required to avoid fruit being downgraded or rejected. Because scale insects have not been considered a high priority for viticultural research, knowledge about their biology and ecology in vineyards is limited.

### Scale species

The scale species most commonly found in Australian vineyards are grapevine scale (*Parthenolecanium persicae*) and frosted scale (*Parthenolecanium pruinosum*), with several other species found rarely. The differences between the main scale species are subtle and they can be difficult to distinguish. Grapevine scale adults are slightly bigger and oblong in shape, where frosted scale adults are round. Another feature that differentiates the two species is egg colour, with grapevine scale producing pink eggs and frosted scale producing pale yellow eggs. In any case, identifying the species is not particularly useful because their life cycles are very similar and control methods are the same.

### Life cycle

Soft scale species complete their life cycle over a 12-month period. As the life cycles are similar for the two main scale species found in Australia, a general model is provided, beginning with the winter period.



Table 1. Scale life cycle

Season	Scale development
Winter – vines are dormant	Overwintering juvenile crawlers at second or third instar (developmental) stage, live under bark on the cordon and canes.
Early spring – vine growth begins	Crawlers emerge as weather warms and develop into young adults. As they grow, their shell changes from soft to hard.
Late spring – grapevine shoots established	Young adults mature, produce eggs under their shell and die.
Early summer – shoot growth slows	Eggs hatch and move to underside of leaves in sheltered parts of the canopy where they develop through first and second instar stages.
Late summer – berry ripening	Juvenile scale (1-1.5 mm in length) inhabit leaves, shoots and berries.
Autumn – onset of dormancy	The next generation of juvenile scale (second or third instar) move under bark on canes or cordons.



Eggs of frosted scale. Photo courtesy: Jenny Venus



Juvenile grapevine scale on the back of a Chardonnay leaf. Photo courtesy: Jenny Venus



## Damage

There is an indirect impact of scale in wine-grapes, caused when the honeydew produced by the scale is colonised by microorganisms and turns black. With high scale numbers, honeydew production can appear to completely cover the fruit and leaves, eventually turning into 'sooty mould'. The presence of this mould is widely considered a defect that can reduce fruit quality for winemaking.



*Sooty mould on red grapes (L) and scale causing honeydew to drip from Sauvignon Blanc(R) grapes. Photos courtesy: Jenny Venus*

More directly, scale can divert nutrients away from the vine and in high numbers this has the potential to affect growth and yield. Another concern about sap-sucking insects is their potential to spread viruses within and between vineyards. While most scale insects are unlikely to move between vines, they can be moved within and between vineyards on machinery or on the wind.

## Monitoring

Vines should be monitored for the presence of scale throughout the growing season, but winter is a useful time to assess scale levels and apply a chemical control if necessary. (See the AWRI fact sheet *Scale – factors influencing their prevalence and control* for information on chemical control options). During dormancy growers should check for scale underneath bark on spurs, canes and cordons. If many scale are found, the areas should be tagged for further monitoring or possible treatment with winter oil. During spring these 'hot spots' can be revisited and double-sided tape used to identify when juvenile scale (crawlers) begin to move.



*Juvenile scale overwintering under bark (removed).*



Scale insects are difficult to detect at low densities, but the presence of ant activity is often a good indication that they are present. The ants are attracted to the honeydew produced by the scale and can be active from early spring. Another indication of scale is the presence of sooty mould on leaves and bunches. If this is observed towards the end of the grapevine growing season or leading up to harvest, the registered control options are often not available for growers who are producing grapes for export wine.

Once an infestation is found, it is important to identify how widespread the scale problem is and to mark the area in case future action is required. If the scale infestation is isolated to one area, the aim is to just treat that area. The goal of targeted sprays is to minimise the impact on beneficial insect species. If scale presence is widespread throughout the block and numbers of crawlers are high, more widely targeted chemical control may be required. Details about the role of beneficial insects and the chemical control options are provided in the AWRI fact sheet *Scale – factors influencing their prevalence and control*.

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