

# Soft scales in New Zealand vineyards

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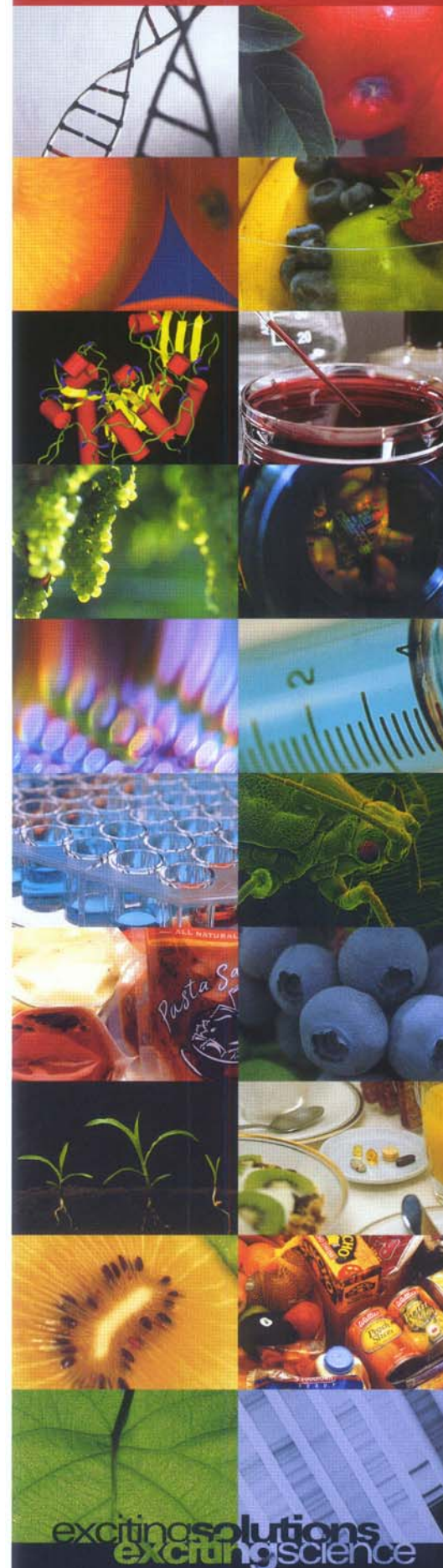
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## **BACKGROUND**

‘Soft scales’ (Hemiptera: Coccidae) are sap-sucking insects in the superfamily Coccoidea. They are closely related to armoured scale insects (Diaspididae) and mealybugs (Pseudococcidae).

Coccidae have an ‘open’ digestive system, and they produce copious quantities of honeydew (like mealybugs, but unlike armoured scale insects). Their biology is often not well known. This is especially so in New Zealand.

There are many species of native Coccidae in New Zealand, but all of the pest species are exotic (Table 1). They are all rather similar, and some species are very polymorphic (i.e. the same species may come in different shapes, sizes and colour). Identification can often only reliably be made by an expert taxonomist.

Most of the pest species are parthenogenetic – reproducing from females only – and may produce many hundreds of offspring / female. Yet, unlike mealybugs, they are usually univoltine (have only one generation a year), which tends to reduce their ability to spread rapidly.

The result is that populations of these scale insects tend to be very patchy – often occurring on only a few vines in a block. Because they also usually live on the wood (rather than on leaves), and are generally a rather dark, mottled brown colour, they are very inconspicuous and their presence may go undetected for many years. Even though they may produce copious quantities of honeydew, this can often be mistakenly associated with other insects such as mealybugs.

The exotic soft scales present in New Zealand are well known as important or minor pests from many countries around the world. On fruit crops, they are generally considered minor pests because of the honeydew they produce. If, as suspected, they are proved to be vectors of grapevine leafroll disease, then they may well have to be considered major pests in New Zealand vineyards.

## **SAMPLING IN VINEYARDS**

In an attempt to refine our knowledge of soft scales in vineyards, samples were solicited from Marlborough and Hawke’s Bay vineyard workers. We postulated that the most likely time of year to find the scale insects was during pruning, when canes were exposed, and workers were removing or collecting canes for budwood.

At a grapegrowers seminar in Marlborough, growers were invited to send any pruning material they found that had something they believed was soft scale, to the Marlborough Research Centre.

In addition entomologists in Hawke’s Bay actively searched for soft scales. The list of vineyards surveyed and results have been provided in confidence to New Zealand Winegrowers (currently included as Appendix 1 of this report).

Very few scale insect samples were found or sent to HortResearch. During the vineyard survey in Hawkes Bay, some indication of scale insect infestation was found by chance on a

single Niagara table grape at the end of a row in one vineyard planting. This grape received insecticide applications spasmodically. The samples collected from this vine were found to be dead on arrival at Mt Albert Research Centre and therefore not identifiable. In Marlborough *Parthenolecanium* sp. was found on a 'home garden' grapevine. Subsequent to the survey, potential scale samples were sent in by two other vineyards, one in Hawkes Bay and one in Marlborough. Unfortunately samples were either dead and unidentifiable or not soft scale insects.

Clearly, the patchy distribution of these insects in vineyards, and their general obscurity, means that improved sampling techniques are required.

An alternative approach is to maintain a 'watching brief' on scale insects, such that they can be identified when a vineyard manager locates a 'patch'. If a research programme is considered valuable, then it can be implemented using that population.

## **CONCLUSIONS & RECOMMENDATIONS**

Over the years, incidental records of the species in Table 1 have allowed a broad picture of their presence in New Zealand to be established. But, for the grape industry, this may be incomplete or mis-leading. For example, even though a species has been found both throughout New Zealand, and on grapes, it does not mean that it has been found in vineyards throughout New Zealand. With the rapid expansion of grapes into new regions over the past decade, we really do not know what species are present, or are likely to be present, in our vineyard habitats around the country. A safe approach would be to assume that most species may eventually be found in vineyards.

We would recommend that New Zealand Winegrowers continue to monitor for the presence of scale insects, perhaps through their Sustainable Winegrowing New Zealand programme. If outbreaks of soft scale are regularly observed on particular vineyards or in particular regions, then a research programme focussed on those vineyards or regions should be implemented to identify the species concerned and capture information on insect phenology so possible control measures can be identified.

## **ACKNOWLEDGEMENTS**

We would like to acknowledge the assistance we received from grapegrowers and wine companies who allowed us to survey their blocks or undertook some survey activities on our behalf. Thanks also to Dave Werrey and to Philip Carter and Tim Herman from Fruitfed Supplies Limited for their assistance with the survey in Hawkes Bay,

**Table 1.** Soft scale insects possibly found in New Zealand vineyards

<b>Latin name</b>	<b>Common name</b>	<b>Host plants other than grape</b>	<b>Seasonal phenology</b>	<b>Location in NZ</b>
<i>Pulvinaria vitis</i>	Cottony vine scale	beech, alder, poplar, willow, hawthorne	Probably univoltine, especially in the S. Island	Throughout NZ
<i>Parthenolecanium corni</i>	Brown scale or European fruit lecanium	polyphagous	Usually univoltine	Throughout NZ
<i>Parthenolecanium persicae</i>	Peach scale	polyphagous	1-2 generations/yr. Parthenogenetic	Throughout NZ
<i>Coccus hesperidum</i>	Soft brown scale	polyphagous	3-5 generations/yr. Mainly parthenogenetic and ovoviviparous	Throughout NZ
<i>C. longulus</i>	Long brown scale	polyphagous	? parthenogenetic	Rare. Auckland, Bay of Plenty, Marlborough
<i>Saissetia oleae</i>	Black scale or Olive scale	polyphagous	1-2(?) generations/year. parthenogenetic	Throughout NZ
<i>Saissetia coffeae</i>	Hemispherical scale	polyphagous	>1 generation/year. parthenogenetic	Throughout NZ

## **APPENDIX 1**

### **List of vineyards searched in Hawkes Bay during August and September 2003**

(results from the survey are noted and provided in confidence to New Zealand Winegrowers)

Note: 7 of the 12 vineyards below were searched by HortResearch staff. For the remaining 5 vineyards, HortResearch relied on an experienced vineyard manager or Fruitfed Supplies Ltd staff to conduct the search and report any findings to HortResearch

HortResearch – Lawn Road block

Te Mata Estate Winery – Havelock North block

Ngatarawa Wines – Ngatarawa Road block

Kingsley Estate Vineyard – Gimblett Road block

Erindale Vineyard – Mt Erin Road block – Scale found in Niagara table grape (essentially unsprayed). Two more potentially infested 5 year old vines found subsequent to survey (3 December 2003)

Te Awa Farms – SH50 Block

Chris Brownlie – Bayview block

Delegats Wine Estate Limited – Gimblett Road block

Campbell Agnew – Lawn Road block

Bruce Ellingham – Ohiti House block

Bradshaw Estate Winery – Havelock North block

Montana Wines Limited – Twin Rivers block