Updating our anti-Phylloxera armoury

Comprehensive trials by Agriculture Victoria scientists in Rutherglen have found that more care needs to be used to ensure that footwear disinfestation is effective.

The Agriculture Victoria team's work involves a comprehensive set of trials to both re-assess our current responses to the damaging grapevine pest phylloxera and develop new ways to manage and, where possible, control new detections.

The primary aim of a recently completed project, funded by Wine Australia and the Victorian Department of Economic Development, Jobs, Transport and Resources (DEDJTR), was to scientifically validate disinfestation treatments set out in the National Phylloxera Management Protocol that was endorsed in 2009.

A lot has changed since the protocol's endorsement in 2009 (for example, since the endorsement we have learnt that there are six separate genetic strains of phylloxera), which meant that re-testing the efficacy of disinfestation techniques — particularly farm-gate hygiene — was critical.

'When we were looking at the efficacy of bleach as a disinfestation treatment for footwear and hand-held tools we found that when the current recommended procedure and timing was used (2 per cent active sodium hypochlorite for 30 seconds and a water rinse thereafter), more than 50 per cent of insects were surviving, and that was across all six phylloxera genetic strains tested', said Research Scientist Dr Catherine Wanjiru Clarke.

There were some sobering discoveries, including the finding from the footwear disinfestation trial that if phylloxera survive a treatment, they can continue to live and even to breed.

The footwear disinfestation trial was conducted for 30 seconds, 40 seconds and 60 seconds with varying rates of active sodium hypochlorite and with and without a water rinse. The results showed that the 'water rinse' after immersion in the chlorine contributed significantly to phylloxera surviving disinfestation.

However, simply increasing the time of immersion from 30 seconds to 60 seconds in 2 per cent active sodium hypochlorite and eliminating the water rinse step resulted in 100 per cent efficacy across the six strains tested.

Since early 2017, Vinehealth Australia has incorporated these findings into updated footwear disinfestation protocols (see following page in this issue of *R&D at Work*) and communicated these changes to the Australian grape and wine community.

Dr Clarke, an entomologist with a background in biological control and pest management, was recruited to carry out much of the research work for the two-and-a-half-year project, working alongside Dr Kevin Powell, who has been a significant contributor to our understanding of phylloxera for two decades.

Over the next 18 months, Dr Clarke and the current Principal Investigator, Associate Professor Paul Cunningham, will work with Vinehealth Australia to assess all of their findings and, if required, make formal recommendations for changes to the National Phylloxera Management Protocols to the National Viticulture Biosecurity Committee (NVBC) and the relevant sub-committee of the national Plant Health Committee.

While the research suggests some treatments require significant tightening, in other cases less rigorous alternatives were shown to be just as effective and could lead to savings in time, money and the effort required.

Dr Clarke, A/Prof Cunningham and technical officer Bernadette Carmody are preparing to move onto a new three-year project that will continue the search for alternative disinfestation treatments to chlorine for footwear, fill gaps in our knowledge about the biology of phylloxera, and try to uncover new ways to detect and control it.

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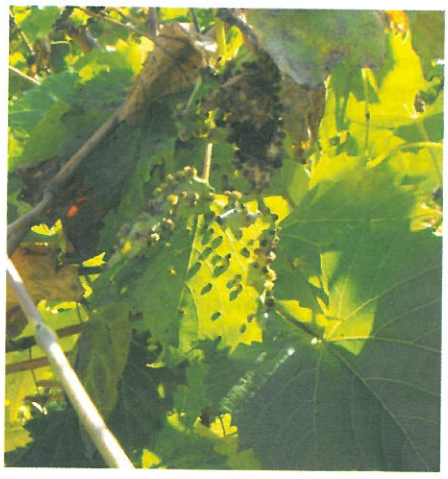
The potential to use sniffer dogs to detect phylloxera certainly warrants further attention. Laboratory trials run as part of the first project suggest that dogs can recognise odours produced by either phylloxera in isolation or phylloxera-infested roots.

Detecting phylloxera by smell has great appeal because visual detection is made difficult by its size, asexual life cycle and predominantly subterranean habitat.

Dogs have many advantages, but one big disadvantage. When they move from place to place they may carry the pest with them, just as humans do. For that reason, A/Prof Cunningham, a chemical ecologist, will devote some of the current project to developing an electronic nose that has the same skillset. ■



Leaf galling Phylloxera
Image courtesy Agriculture Victoria

Bernadette Carmody and Dr Catherine Wanjiru Clarke • Image courtesy Agriculture Victoria