Xylella: impact on Australian vines

In the June 2017 issue, Suzanne McLoughlin, Vinehealth Australia's Technical Manager, reported on the International Symposium on *Xylella fastidiosa*, where a range of international experts shared their knowledge and experience dealing with Australia's number one exotic plant pest.

The Australian Bureau of Agricultural and Resource Economics and Sciences (ABARES) has since completed a study of the likely economic impacts of *Xylella fastidiosa* on the Australian wine industry. We present an extract from the report on page 34 and 35.

The issue

By now, most growers have heard of *Xylella fastidiosa* – Australia's number one exotic plant pest. Xylella, a bacterium that disrupts water flow in plant xylem, is a major threat as it has been reported to infect more than 350 plant species, many of which do not show symptoms with infection. *Xylella* infection in grapevines is known as Pierce's Disease, with grapevine death resulting within a few years of infection. *Xylella* is inherently difficult to control and there are no known treatments to cure diseased plants.

Xylella is transmitted by a range of sap-sucking vectors, the most well-known of which is the glassy-winged sharpshooter. Although this sharpshooter species is not present in Australia, our native insects could serve as vectors for the bacterium.

Until now, very few economic studies have been undertaken to quantify potential impacts of Pierce's Disease on the Australian grape and wine industries.

The ABARES new report: Economic impacts of *Xylella fastidiosa* on the Australian winegrape and winemaking industries, reveals the likely economic impact of an incursion – up to $7.9 billion over a 50-year timeframe.

Are we ready?

Based on international experience, four key factors must intersect for Pierce's disease to be a threat – the pathogen, suitable host plants, vectors and various environmental and cultural factors.

The ABARES model assumes the presence of the pathogen, vectors and grapevines as hosts and uses different environmental scenarios to model the likely economic impact for the Australian wine industry.

Despite the difficulty in making predictions with any level of certainty, what is clear, is that an incursion would be significant for wine, as well as for a range of other plant industries.

Vinehealth Australia will examine Australia's preparedness for an incursion in a future issue of *Australian & New Zealand Grapegrower & Winemaker Magazine.*

Economic impacts of *Xylella fastidiosa* on the Australian winegrape and winemaking industries

An extract of the ABARES report

The modelling

ABARES approached the analysis by mapping the maximum extent of an incursion. Uncertainty about habitat suitability warranted three scenarios of progressively smaller areas:

- Scenario one: all existing winegrape growing regions.
- Scenario two: Scenario 1 areas with an average minimum winter temperature above 1.7°C (note from Vinehealth Australia; cold curing has been attributed to reducing *Xylella* levels).
- Scenario three: Scenario 2 areas in close proximity to riparian vegetation.

Two spread rates between vineyards were adopted based on habitat suitability: 10 percent a year (highly suitable) and 4 percent a year (partially suitable).

Vineyard suitability depended on whether minimum winter temperature was: above 4.5°C (highly suitable); between 1.7°C and 4.5°C (partially suitable); or below 1.7°C (unsuitable).

In scenario 1, all vineyards were deemed highly suitable, while Scenarios 2 and 3 assumed a mix of highly and partially suitable vineyards.

The potential economic impacts for affected vineyards were assumed to comprise adjustment costs and foregone gross margins. Adjustment costs, largely replanting costs, in turn depended on expected gross margins and future winegrape prices.

Three vineyard profitability groups were defined to reflect replanting decisions, those with: (i) negative gross margins; (ii) positive gross margins, but replanting is not profitable; and (iii) positive gross margins and replanting is profitable. Growers are likely to replant if they expect it to be profitable in the long run. Thus, only group (iii) makes this decision while others exit the winegrape growing industry.


Pierces Disease, courtesy University of California.

The analysis also considered a scenario in which government intervenes to restrict movement of the disease between regions. Rather than assuming *Xylella* appears in all regions (as in the three maximum extent scenarios mentioned above), this alternative scenario reflects *Xylella* appearing in a region and being contained. The benefits of containment (that is, the costs avoided) were estimated for two ABARES catchment land-use areas – Murray Darling and Lower Murray. Both offer high habitat suitability.

Given the sensitivity of replanting decisions to expected prices, two winegrape prices were used: the low prices that prevailed in 2014–15 and prices that were 25 per cent higher. Cost estimates for all scenarios were expressed in present values terms using a real discount rate of 7 percent, with impacts developing over 50 years.

The results

Estimates of the economic impacts of X. *fastidiosa* on the winegrape industries ranged from $2.8 billion (Scenario 3 – the more likely outcome) to $7.9 billion (Scenario 1) over 50 years at 2014–15 prices. The large range suggests that the extent to which Australian conditions are likely to suit the disease and its vectors is likely to be a major determinant. The impact was shared across the wine industry, with around three-quarters borne by the winemaking industry.

Higher wine grape prices intensify the impact on winegrape growers, but lessen the impact on winemakers. This is because winegrape growers incur larger gross margin losses and spend more on replanting, as it is more profitable to do so. In turn, higher replanting rates means that winegrape production is less affected, thereby lessening the impact on wine makers.

Xylella poses a threat to the productivity, sustainability and competitiveness of Australia's wine industry. While there is uncertainty about which winegrape areas would be affected, nearly all (98 percent) vineyards could be partially or highly affected if only winter temperature thresholds matter.

The future

The results demonstrated that if *Xylella* can be contained within a region (as was the case in the Temecula Valley in California), then the aggregate impact on the wine industry would be a fraction of the impact of an uncontrolled spread. For example, the ABARES results found that containing a potential outbreak to either the Murray Darling or Lower Murray regions could avoid losses (excluding containment costs) between $2.0 billion and $2.6 billion on a net present value basis. However, containment costs are likely to be substantial.

Glassy-winged sharpshooter, Reyes Garcia III, USDA Agricultural Research Service, courtesy Bugwood.org.

In the United States, for example, these were around $US50 million a year in 2013, implying a $0.7 billion cost over 50 years on a net present value basis.

However, ongoing measures to reduce the risk of *Xylella* entering Australia are likely to be more cost-effective than implementing eradication or containment programs were it to enter. International experience suggests that successful eradication is unlikely. Nonetheless, were it to enter, enhancing early detection capacity for cost-beneficial eradication would be prudent.

Prevention activities are likely to cost less than the costs and losses associated with an eradication campaign in the event of an incursion. While not estimated in this study, the losses associated with an eradication campaign would be much less than the corresponding losses of a containment program—estimated to be around $0.3 billion for the most likely scenario.

"It would be prudent to invest in improving early detection capacity to increase the likelihood of the cost-beneficial eradication of the pathogen, given the significant cost and losses associated with a containment program, and the uncertainty around its success. The uncertainty around the success of eradication and containment (if eradication fails), and the significant costs of a containment program and extensive losses of an uncontrolled spread (if containment fails) collectively imply there is significant pay off for investment in measures to reduce the likelihood of entry," the report concludes.

To view the full ABARES report visit www.agriculture.gov.au/abares/research-topics/biosecurity/biosecurity-economics/xyella-impact-report

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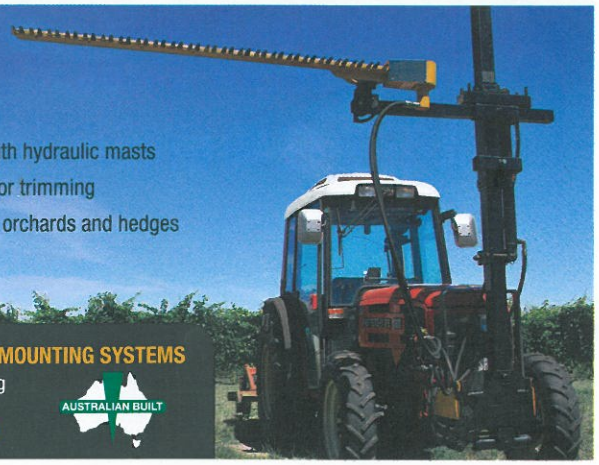

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