

Research targets costly grapevine disease

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The New Zealand wine industry is better equipped to battle a devastating plant pathogen thanks to new research carried out by Vaughn Bell, a PhD candidate at Victoria University of Wellington.

Economic losses from grapevine leafroll-associated virus 3 total tens of millions of dollars in New Zealand alone (a country that accounts for 0.9% of world wine production). The virus is transmitted by insects called mealybugs, which spread the disease while feeding on grapevines. Leafroll 3 reduces grapes' sugar content, flavour and yields—particularly for premium red-grape varieties such as Pinot Noir.

There is no cure for leafroll 3 and, once infected, vines eventually succumb to the disease, leaving growers with no option but to remove them and replant entire vineyards at considerable expense.

Vaughn, a scientist with The New Zealand Institute for Plant & Food Research Limited based in Havelock North, has shown that the virus can be accurately diagnosed by visual assessment on red varieties. Growers can then remove individual infected vines annually—a process known as 'roguing'.

The research has also demonstrated that only infected vines need to be removed, not the healthy nearest neighbouring vines as well, as was previously assumed. In addition, Vaughn's work has added much-needed clarity to the relationship between the disease and the mealybugs that carry it.

"The complete elimination of mealybugs from vineyards is not needed and would probably be impossible," says Vaughn, "but to control the virus, we do need low population densities of vectors. So growers must not only manage their infected vines, but also the mealybug populations in their vineyards."

Vaughn completed both his Bachelor's and Master's degrees at Victoria University. His doctoral research is supported by New Zealand Winegrowers, the national wine industry organisation, and Plant & Food Research.

Vaughn's supervisors, Professor Phil Lester from Victoria University and Professor Gerhard Pietersen from the University of Pretoria, South Africa, say his work is significant and demonstrates the value of dedicated scientific research for New Zealand wine and viticulture.

For the past five years, Vaughn has been a key team member of a New

Zealand Winegrowers' project that is tackling both leafroll 3 and mealybugs in participating vineyards.

The project, co-funded by the Ministry for Primary Industries' Sustainable Farming Fund, extends over Hawke's Bay, Wairarapa and Marlborough. Using protocols that incorporate findings from Vaughn's research, many vineyard managers have been able to reduce disease incidence to less than one percent, improving the longevity and economic viability of their vineyards.

"Vaughn's work has helped halt the spread of leafroll 3 within New Zealand vineyards," says Dr Simon Hooker, General Manager Research at New Zealand Winegrowers. "His ongoing engagement with the sector has also helped generate greater awareness among growers about the disease and the role played by mealybugs."

Vaughn says his work on finding ways to reduce the impact of leafroll 3 is far from over.

"We've developed what seems to be an effective virus management programme in red-grape varieties. The next challenge is to do the same for the vines of white grape varieties which, when virus-infected, lack the visual symptoms."

Provided by Victoria University of Wellington

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