

Suppression of Phylloxera in grapes with the application of biostimulant Mycorrcin

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Key words

Phylloxera, grapes, Mycorrcin

Background

New Zealand may have developed the first effective way of combating the scourge of grape growers worldwide, the root-feeding insect phylloxera. Bio-Start products have restored a semillon block in Marlborough that was so badly damaged by phylloxera that vines could have been kicked out of the ground. Now, many grape growers are using Bio-Start as a routine management tool.

In 1997, Marlborough grower Owen Graham was about to complete replanting his 19ha vineyard with phylloxera-resistant rootstock. All growers have had to do this since the insect tightened its grip on the industry in the late 1980s.

Late last century, phylloxera nearly destroyed France's wine industry by taking out a million hectares of vines. Then it was Australia's turn. In the early 1900s the insect reduced the country's largest grape area at Rutherglen by 75%. Grafting favoured wine varieties onto roots of resistant varieties has until now been the only effective control strategy.

In New Zealand, the restricted availability of grafted vines is restraining vineyard development.

Mr Graham was about to replant his last block in 1997 when he was approached by Geoff Warmouth, the Bio-Start representative in Marlborough.



Bio-Start New Zealand has developed a range of enzyme-based products that promote beneficial organisms which improve animal and soil productivity. Dramatic results are being reported with Bio-Start products in the livestock sector. Bio-Start does not kill phylloxera - nothing has yet been found to do that - but Mr Warmouth theorised that Bio-Start might strengthen the grape vines sufficiently to withstand the presence of the insect in its root system.

He was dead right. Mr Graham says his semillon block was “absolutely bugged” before treatment.

“It was down to producing 9.17 tonnes per hectare when it should been over 13. It was growing no new canes, and we were down to spur pruning it for new wood.”

Mr Warmouth’s programme of ground applications of Mycorrhizin followed by foliar treatments with Foliacin, performed a near miracle, says Mr Graham.

“The first year after treatment the vines produced seven really good quality canes out of every head, and it produced 16.4 tonnes per hectare. It’s never looked back since. In 1999, we had to cut back on bud numbers because the wine company introduced yield restrictions. It was harvested at 2.5 brix higher but still yielded 13.5 tonnes per hectare. This year, Mr Graham says the block needed only one treatment of Mycorrhizin with Foliacin every 20 days up to harvest. It was a poor flowering season for grapes in Marlborough but the semillon continued to amaze with 12.57 tonnes per hectare.

“It was probably the best block in the vineyard for good cane,” he says. “When it first started coming right, I really loaded the vines up with 70 buds to see if I could hurt them, but you would never even tell now that they had been diseased. People can’t believe they ever had phylloxera at all. But you could dig up the roots and see the tiny insects with your naked eye.”

Mr Graham now uses Bio-Start routinely throughout his vineyard. “We harvested 6.63 t/ha at 22.7 brix from an 18-month old block of sauvignon blanc in 1999. People can’t believe that either.”

So what’s going on here? Gerard Besamusca of AgConsult in Waihi was the first to introduce soil testing for biological activity to New Zealand. He says a combination of factors may be at work.

“Grape vine roots are damaged at phylloxera feeding sites, allowing the entry of fungal diseases like fusarium and pythium which may be causing more damage to the vine than the insect itself.

“If you can stimulate root growth, the plant is better able to withstand this disease pressure. “Then there are the mycorrhizal fungi that Bio-Start promotes in the soil. There is a theory, as yet unproven, that these may be changing the quality of the vine roots so they are less attractive to the insect, and the insects may instead be feeding on the fungi themselves. This would also improve nutrient flows in the plant.

“But possibly the major factor is that the enhanced biological activity and diversity in the soil promoted by Bio-Start are also having a suppressive effect on the fusarium and pythium.

“We should also note that Owen Graham is making full use of suspension fertilisers which would be an additional supporting factor in all of these processes.”

Much is yet to be learned about the complex interrelationships among the myriad of microbes and organic compounds that inhabit a healthy soil.

Program used

October 1998: 4lt/ha Mycorrcin and 1lt/ha Digester added to fine particle fertilizer and sprayed over entire block, followed 2 weeks later with 2lt/ha Mycorrcin sprayed in the weed spray strip.

December 1998: 15lt/ha Mycorrcin sprayed in the weed spray strip

Mid December 1998: 1lt/ha Foliacin sprayed onto the foliage with liquid fertilizer

January 1999: 2lt Mycorrcin sprayed in the weed spray strip

Early February 1999: 5lt/ha Mycorrcin sprayed in the weed spray strip and 300ml/ha Foliacin sprayed onto foliage with 5kg/ha Melspray 6-5-30



Untreated prior to pruning



Treated prior to pruning



Untreated



Treated