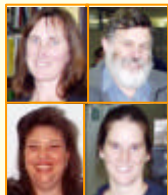




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It promotes cooperative scientific research to accelerate quality management from vine to palate

Australian grapegrowers and winemakers are key stakeholders in the CRCV, contributing levies matched by the Commonwealth Government and invested by the Grape and Wine Research and Development Corporation in the Centre



# Hot water treatment of grapevine cuttings reduces incidence of *Phaeomoniella chlamydospora* in young vines

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## Introduction

Many new vineyards suffer losses due to Petri disease (Figure 1). Young vines affected are spindly, dying back along the shoots and often failing to produce fruit. In Australia, the disease is mainly caused by *Phaeomoniella chlamydospora* (*Pch*), although *Phaeoacremonium aleophilum* (*Pal*) may also be implicated. Both fungi infect the pith and xylem tissues of grapevine wood that is two years old or more (Figure 2). Thus, there is no way to screen planting material before it is sold. It is important, therefore, to identify a treatment that can be routinely applied to cuttings that will ensure young vines are free of infection.

Hot water treatment of grapevine cuttings at 50°C for 30 mins is effective against phylloxera, crown gall and phytoplasma diseases (Figure 3). We observed that vine samples diagnosed with Petri disease by Crop Health Services at the Institute for Horticultural Development - Knoxfield rarely came from vineyards that were planted with hot water treated material. Is hot water treatment also effective against *Pch* and *Pal*?

## Materials and methods

**Experiment 1** - Half of cuttings harvested from infected Ramsey mother vines were hot water treated while the remainder were left untreated. All cuttings were then callused and established in new nursery beds. After 12 and 18 months, 100 young vines were sampled from each treatment. Sampled plants were cut open, moist-incubated for 6-8 weeks and examined for presence of *Pch* and *Pal*.

**Experiment 2** - Cuttings were harvested from infected Zinfandel mother vines and the above procedure was repeated. This time, however, vines were sampled after 6 months growth as well as 12 and 18 months.

**Experiment 3** - Twenty dormant one-year-old Pinot Noir rootlings suspected of being infected with *Pch* were hot water treated, planted into pots and grown in a glasshouse alongside 20 untreated Pinot Noir rootlings from the same source. After one season, the vines were cut open, moist-incubated for 6-8 weeks and examined for the presence of *Pch*.

## Results and conclusion

**Pch:** When used on dormant cuttings, hot water treatment significantly reduced the level of *Pch* infection, but it was not effective when used on rootlings (Table 1). This suggests that if hot water treatment is delayed until the vines are one year old, infection courts have become well-established and are more difficult to eradicate.

**Pal:** Hot water treatment was not as effective against *Pal*, possibly because this fungus has a high optimum temperature for growth (35°C). It is still unclear what role *Pal* plays in causing Petri disease in Australia. It is not consistently associated with diseased vines and we have been unable to fulfil Koch's postulates by reproducing vascular streaking symptoms.

Hot water treatment of dormant cuttings shows promise as an effective way of eliminating *Phaeomoniella chlamydospora* and thus preventing the development of Petri disease in young vines.



Figure 1  
Three-year-old vineyard (cv. Marsanne/Kober 5BB) badly affected by Petri disease

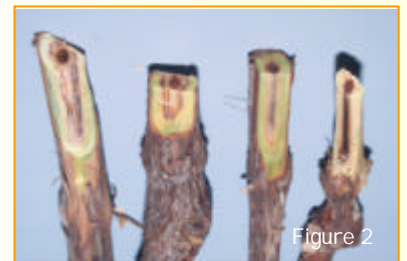


Figure 2  
'Black goo' symptoms in young vines affected by Petri disease



Figure 3  
Hot water treatment (30 mins, 50°C) of grapevine cuttings

**Table 1** The effect of hot water treatment on *Pch* and *Pal* infection of grapevine cuttings and rootlings

Cultivar	Sampling time after treatment (months)	Proportion of cuttings infected with <i>Phaeomoniella chlamydospora</i> (%)		Proportion of cuttings infected with <i>Phaeoacremonium aleophilum</i> (%)	
		Untreated	Hot water treated	Untreated	Hot water treated
Ramsey cuttings	12	26	3	17	21
	18	12	1	14	6
Zinfandel cuttings	6	13	0	15	2
	12	45	4	6	4
	18	45	3	6	4
Pinot Noir rootlings	6	30	20	Not assessed	Not assessed