Biological and Chemical Control of Eutypa Dieback

FINAL REPORT to

GRAPE AND WINE RESEARCH & DEVELOPMENT CORPORATION

Project Number: **CRV 96/3**

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SUMMARY

This one year project was set up to initiate long term studies on the chemical and biological control of Eutypa dieback. Because symptoms take at least 3 years to develop results from that work were not expected within the funding period of the project.

However, assessments made 2 years after the treatments were applied showed that injections of either Benlate or the bio control agent *Trichoderma* did not retard the development of Eutypa symptoms in severely infected vines.

Overall the results showed that severely affected vines cannot be rehabilitated with trunk injections of Benlate or *Trichoderma.*

Further work needs to be done to evaluate these treatments on less severely affected vines.

The experimental sites are now being utilised by PhD students working on various aspects of Eutypa in the present CRCV program 2.2.

BACKGROUND

Eutypa dieback is a degenerative disease of mature vines, caused by the fungus *Eutypa lata.* This disease is not obvious until vines are around 10 to 12 years old and it is at this stage that yields begin to decline. In California for example, yields of infected vines declined by 83% in Chenin blanc vineyards but in general yield losses of 30 to 60% were measured. Other losses are incurred in replanting affected vineyards and in delays in productivity. The disease is widespread in Australia and has been reported to affect 60% of vines in some vineyards. However, little work has been done to evaluate its effect on vineyard profitability, although it is considered a major factor associated with the decline of old vineyards. Recent surveys in the Eden Valley have detected Eutypa in 70% of vines in some areas and in these vineyards the disease is significantly reducing production.

The fungus infects through large pruning wounds and can be controlled to some extent by applying the fungicide benomyl to the pruning surface. However, this treatment is not always completely effective when evaluated in the field and the reasons for this are unknown.

An integrated approach to *Eutypa* control is needed and this may be feasible with the use of fungal antagonists and chemicals applied to pruning wounds.

Recent work from California has shown fungal antagonists such as *Trichoderma* have potential for pruning wounds from *Eutypa* infection as well as several new fungicides that have not been evaluated in Australia. Another approach from New Zealand indicates that infested vines can be rehabilitated following injection treatments with an antagonistic fungus.

With the increased number of aging vines in the industry and the widespread practice of "topping" and reworking large acreages of vines, *Eutypa* dieback will become an even bigger problem in the future. There is an urgent need to develop new approaches to the control of this disease. Vineyard managers in many areas are urgently seeking advice on how to manage this disease and to prevent further yield decline in older vineyards. The results from this project should provide this information.

OBJECTIVES

The aim of this project is to develop integrated chemical and biological methods to control *Eutypa,* to prevent yield decline in mature and elite vineyards and to prevent sudden collapse and death of reworked or radically pruned vines. Another component of this project is to investigate the role of the fungi reported overseas to be associated with slow dieback of grapevines.

METHODOLOGY

In this project, mature vineyards showing *Eutypa* symptoms in the Eden Valley, McLaren Vale and Padthaway districts were identified and up to 50 vines at each site injected with either the fungicide Benlate or the bio control agent *Trichoderma.*

Benlate was used as it controls *Eutypa* when applied to large pruning wounds. *Trichoderma* fungi have also been reported to inhibit wound pathogens in other tree crops.

Injections were made in winter by drilling a 0.5 cm hole in the trunk of the vine and using specialised syringes or a hydraulic pump to inject 20 mls of Benlate or a *Trichoderma* spore suspension into the xylem tissue. After the liquid entered the vine, the injecting equipment was removed and the holes plugged with a wooden dowel. At some sites a wooden dowel impregnated with *Trichoderma* was also included as an additional treatment.

At all sites each treated and control vine was rated for the severity of infection in November. This was done by rating typical *Eutypa* stunted shoot symptoms and recording the proportion of each vine showing symptoms. Symptoms were recorded in the same year that the treatments were imposed and 1 or 2 years later.

At the Eden Valley vineyard a number of treated and control vines were photographed over several years from a set position and growth stage over several years after treatment. This enabled a pictorial record of disease development to be taken for comparison between years.

RESULTS

The results in figures 1 to 3 show that the disease severity at all 3 sites increased over time and that more of the treatments suppressed or retarded disease development.

DISCUSSION

These trials were initially set up for long term studies, which are still continuing.

Although the results presented in this report show that trunk injections of either Benlate or *Trichoderma* were not effective in retarding the development of *Eutypa* in severely affected vines, they have provided a useful resource for further studies. These trial sites are now being used for further studies on "Trunk Diseases" associated with CRCV project 2.2. For example, vines injected with *Trichoderma,* are being sampled by Ms. S. John and Mr. R. Lardner, both PhD students associated with this project.

In addition the trial sites have been used to obtain data on the economic impact of *Eutypa* on grape production. The results of this work were published in articles in "The Australian Grape Grower and Wine Maker".

Further studies are underway to investigate the use of biological and chemical treatments of pruning wounds for the control of Eutypa dieback.

Figure 1. Change in Eutypa severity from 1996-1998 - Eden Valley

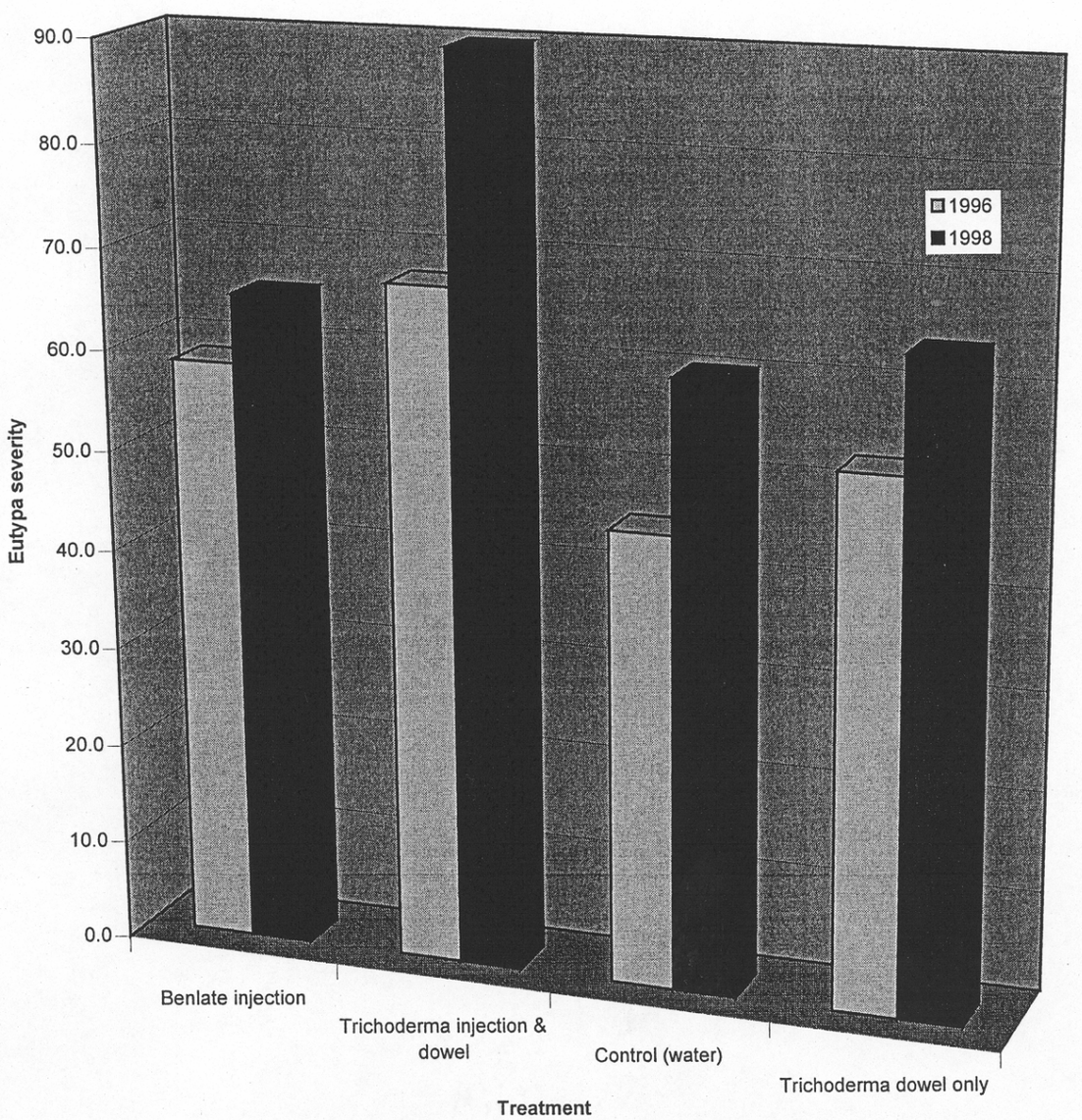


Figure 2. Change in Eutypa severity from 1996-1998 - Padthaway

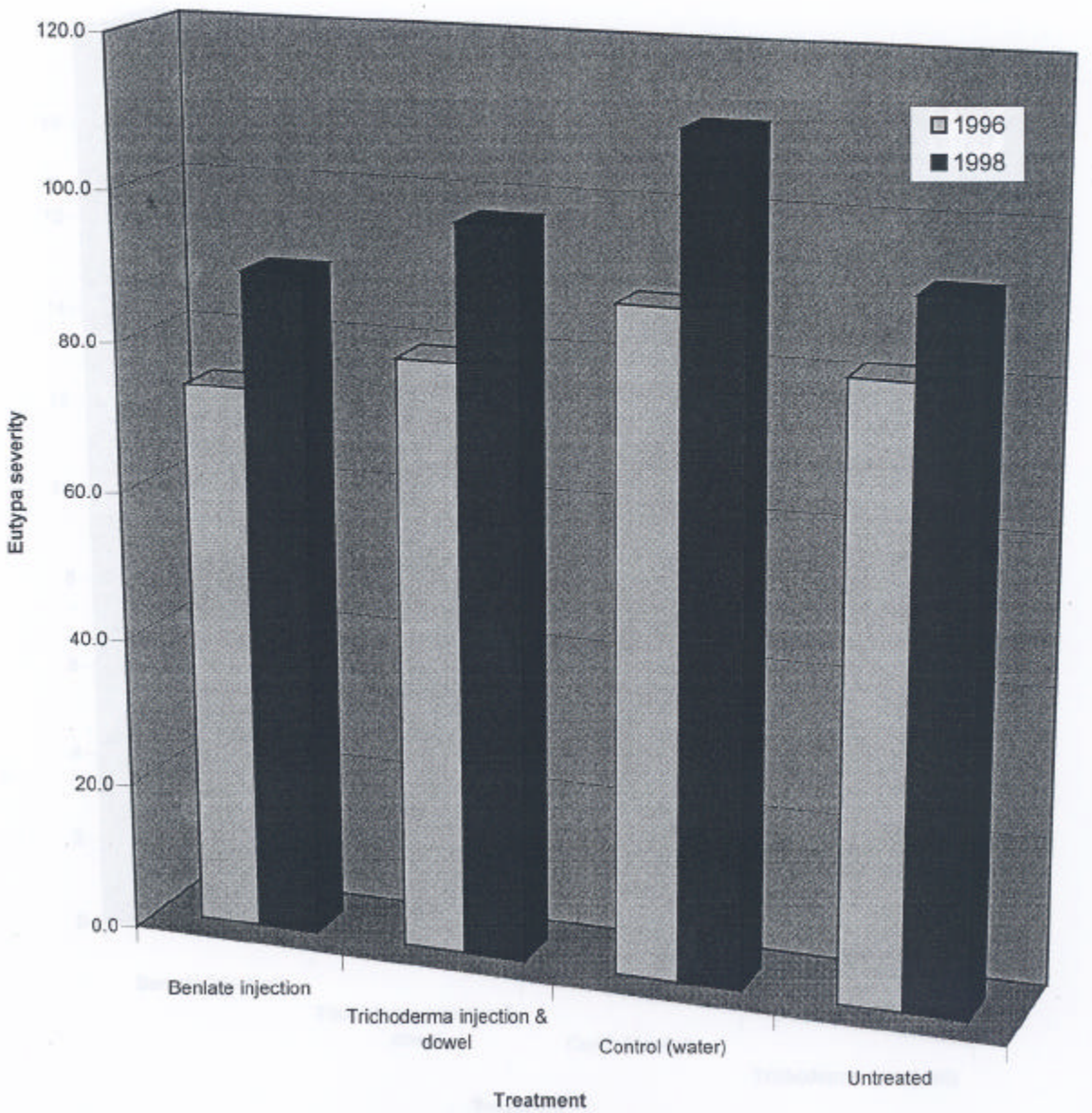


Figure 3. Change in Eutypa severity from 1996-1997 - Reynella

