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Evaluation of Gelseal for control of eutypa dieback

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Summary

Gelseal (430 g/L tebuconazole) at 15-60 ml/100 L applied with a backpack sprayer until runoff provided control of infection by *Eutypa lata* on grapevine pruning wounds. It is recommended that 30 ml/100 L of Gelseal be applied for effective control of eutypa dieback.

Objective

To evaluate the efficacy of Gelseal (430 g/L tebuconazole) as a pruning wound protectant when applied with a backpack sprayer for the control of *Eutypa lata* infection of grapevines.

Methods

Gelseal applied with a backpack sprayer for the control of eutypa dieback was evaluated in a trial which was established at the Nuriootpa Research Centre, approximately 100 km north of Adelaide, South Australia.

On 13 August 2013, one-year old canes of Cabernet Sauvignon vines planted in 1991 were pruned to two buds using secateurs. Gelseal was applied until runoff using a Solo motorized backpack sprayer unit at three dilution rates (15, 30 and 60 ml/100 L) and Folicur® (a.i. 430 g/L tebuconazole) applied at 30 ml/100 L for comparison and included inoculated and uninoculated controls. The four treatments and two controls were each applied to 10 pruning wounds on each vine within three hours of wounding. The trial was set up as a randomised block design with ten replications (vines) per treatment using 60 grapevines. On the same day, all canes (apart from uninoculated controls) were sprayed with sterile distilled water (SDW) and then inoculated by placing a 20µl droplet containing 500 *E. lata* ascospores onto each pruning wound.

On 20 May 2014, treated canes were harvested from vines and returned to the laboratory where they were stored in a cool room 3-4°C before being analysed in the laboratory for the presence of viable *E. lata*. Bark was removed from each cane using a sharp knife. The exposed wood was surface sterilised in 2.5% sodium hypochloride (NaOCl) for 10 minutes and then washed twice in SDW. Using sterilised secateurs, canes were cut into chips (3x2x2 mm) taken from each side of the margin between live and dead wood tissue. Five wood chips were placed onto Petri dishes filled with potato dextrose agar (PDA) amended with antibiotic (streptomycin sulfate 25 µg/L), with two plates used for each cane. Petri dishes were incubated at 23°C under fluorescent light for 12 h each day for 7 days and then assessed for presence or absence of *E. lata* cultures. Data was subjected to analysis of variance (Statistix for Windows v8.0) and used least significant difference (LSD) all-pairwise comparisons test at the 0.05% level, and is presented as mean percentage recovery of *E. lata* from infected spurs and mean percent disease control was calculated by the reduction in percent recovery as a proportion of the inoculated control.



Figure 1. a) Gelseal being applied to pruning wounds of Cabernet Sauvignon vines with a Solo backpack sprayer and b) artificial wound inoculation with ascospores of *Eutypa lata* at the Nuriootpa Research Centre on 13 August 2013.

Results

E. lata was recovered from 44% of the untreated control canes and 4% of naturally infected canes of uninoculated controls. When applied with a backpack sprayer until runoff, Gelseal significantly reduced the recovery of *E. lata* to between 21 and 4% at the three rates evaluated (Table 1), translating to 51-83% control of *E. lata*. Applying Folicur® to wounds at 30 ml/100 L with a sprayer significantly reduced infection to 9%, translating to 79% control of *E. lata*.

Table 1: Efficacy of Gelseal at three different rates and Folicur® applied with a Solo backpack sprayer for the control of *Eutypa lata* when inoculated on day of pruning and treatment. Treatment efficacy was determined based on the mean percent recovery of *E. lata* from the treated spurs. Mean percent disease control of treatments was calculated by the reduction in percent recovery as a proportion of the inoculated control.

Treatment	% recovery	% control
Inoculated control	44 ^a	-
Uninoculated control	4 ^c	-
Gelseal (15 ml/100 L)	21 ^b	51
Gelseal (30 ml/100 L)	15 ^{bc}	66
Folicur (30 ml/100 L)	9 ^{bc}	79
Gelseal (60 ml/100 L)	4 ^c	83

Values within a column with the same letter (a, b or c) are not significantly different from one another

Conclusions

Gelseal applied to dormant vines at rates of 15 to 60 ml/100 L with a backpack sprayer until runoff provided 51-83% control of *E. lata*. In this trial, pruning wounds were artificially inoculated with 500 spores each, fifty times greater than that likely to occur naturally (Carter and Moller 1971), and leading to recovery of *E. lata* from 44% of inoculated controls. Natural disease pressure, as reflected by recovery of *E. lata* from non-inoculated controls, was 4%. When applied at 30 ml/100 L, Gelseal provided similar control to Folicur[®], a product with the same active ingredient concentration of tebuconazole (430g/L).

Based on these results, it is recommended that pruning wounds should be treated with Gelseal, at least 30 ml/100L, on the day of pruning to provide effective control of *E. lata* infection.

Reference

Carter MV and Moller WJ (1971) The quantity of inoculum required to infect apricot and other prunus species with *Eutypa armeniaca*. *Australian Journal of Experimental Agriculture and Animal Husbandry* 11, 684-686.

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