



Protection of grapevine pruning wounds from infection by *Eutypa lata*

By: M. Sosnowski, M. Creaser, T. Wicks, R. Lardner, E. Scott

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- *Eutypa* dieback, or “dead-arm” disease, is caused by the fungus *Eutypa lata*. Its ascospores are known to be able to travel as far as 50 km (30 mi). Once infected by the fungus, vines tend to die within 10 years. Wounds in older wood are known to be more susceptible than 1-year-old wood, probably because they are also larger. Susceptibility to *E. lata* is greatest in early winter, and decreases in late winter and early spring.
- *Eutypa* symptoms include: 1) stunted shoots with chlorotic, cupped leaves, 2) a dark, wedge-shaped area in cross-sections of the trunk and cordons, 3) external cankers, and 4) reduced yields. In California, economic losses attributed to *eutypa* dieback have been estimated as \$260 million per year.
- Management of *Eutypa* dieback relies mainly on: 1) sanitizing the vineyard by removing old wood, 2) avoiding pruning during rainfall events, 3) delaying pruning until later in the season, and 4) treating woods with fungicides, biological control agents, or barriers.
- Benomyl (Benlate®) was most effective in preventing infection, but it is no longer available, and no replacement fungicide is currently registered in Australia. With the goal of finding that replacement, the current authors evaluated **21 products** (see original table) for their ability to inhibit *E. lata* ascospore germination and mycelial growth *in the lab*. The 13 most successful products were then selected –along with 4 new additions- to evaluate their performance *in field trials* conducted between 2000 and 2005.
- The **laboratory evaluations** comprised 2 phases: 1) evaluation of the ability of ascospores to germinate when placed in a Petri dish containing the product being tested; and 2) evaluation of the ability of a mycelial plug placed in a Petri dish containing the product being tested to form a mycelial colony.
- The **field evaluations** were actually 5 different trials varying in set-up and type of products compared. After pruning 1-year-old canes to two buds, researchers applied the product being tested, and then inoculated the wound with *E. lata* spores, either the next day or 14 days after. They also conducted 2 controls –spore-inoculated and spore-uninoculated-, which received water instead of fungicide. To interpret the results, wood chips from the treated canes were obtained the following July, placed on a Petri dish, and incubated under optimal growth conditions. Results were expressed as presence or absence of *E. lata* growth, as well as “*percent of recovery*” of all canes observed. Let’s see the results.

• **Results.**

- 1) The only compound to provide a similar level of control as *Benlate* was *Bavistin* (carbendazim). This is no surprise if we consider that both belong to the benzimidazole group.
- 2) Other fungicides, such as the demethylation inhibitor fungicides (*Fungaflor*, *Nustar*, *Topas*) were also effective, but did not provide the same duration of protection.
- 3) Some other fungicides (*Scala*, *Shirlan*) also reduced infection in some –not all- of the trials.
- 4) *Boric acid* (previously reported to be effective) also proved effective in this study - even though it was evaluated only in one field.
- 5) *ATCS acrylic paint* (alone or mixed with *Bavistin* or boric acid) provided 80-100% control. This paint acts as a physical barrier. The addition of a fungicide is to prevent the colonization of spores landing prior to the application, or entering through cracks that may develop in the paint (not observed in this study).
- 6) *Garrison* (cyproconazole and iodocarb) reduced infection in two fields. Given that this is a paste, it is suited for application to large wounds -rather than every single pruning wound, something that would be uneconomical.

In brief, the fungicide *Bavistin*, showed the best control of *Eutypa lata*. Even though larger wounds are usually the ones targeted for treatment, the authors believe annual pruning wounds warrant treatment, given that even small infections can accumulate over years of growth. Research is on-going to evaluate the application of these protectants using mechanical spray equipment.

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