Typical Eutypa dieback symptoms on 12-year-old Chenin blanc grapevine.

Fungicide protects grapevines from Eutypa

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Eutypa dieback of grapes has recently been recognized as an important vineyard disease, both in California and elsewhere throughout the world. Infection of freshly made pruning wounds by airborne spores of the fungus during or immediately following rainstorms causes cankers in the wood surrounding pruning wounds and eventual dieback of the vine shoots and arms. Although the disease is widespread, the symptoms have been confused in the past, and the "deadarm" symptoms have frequently been attributed to other causes. The disease is important on varieties requiring heavy pruning, especially where large wounds are made to alter the training system or change the grape cultivar.

The fungus, *Eutypa armeniacae,* also causes a dieback disease on apricot trees. Several years ago it was shown that a high concentration of the systemic fungicide benomyl (Benlate), painted or atomized on fresh pruning wounds protected apricot pruning wounds from infection. Following this lead, an experiment was conducted during 1977-79 to determine whether the same treatment would also prove effective on grapevines.

Ten-year-old Grenache vines growing in a vineyard at the University of California, Davis, were used for inoculations. The natural infection level in the Davis area is low, and the vines had no visibly weakened or dead arms. The vines had been trained to a bilateral cordon with five to eight arms on each of two cordon branches. In February, 1977, the arms were shortened to expose wounds 2 to 3 centimeters in diameter. All wounds were made on two-year-old wood.

An experiment was initiated to compare three treatments: (1) inoculation the day of pruning with 100 spores of *Eutypa,* no fungicide application; (2) hand-brushing of a solution of ⅓ pound Benlate per gallon, then inoculation with 100 spores of *Eutypa* on same day; and (3) an uninoculated control, no fungicide application. Groups of two or three adjacent arms on a vine constituted an experimental plot; 20 replicates of each plot were scattered in a completely randomized design on the vines, making a total of 50 sites for each treatment.

Eutypa dieback is a long-cycle disease, and symptoms may not appear on the vine shoots for more than three years after infection. Therefore, it was necessary to culture from the treated pruning stubs to determine whether infection had occurred. Spurs bearing the stubs were removed from the vines in 1979 and brought into the laboratory.

The Benlate paint treatment was very effective in protecting fresh pruning wounds from *Eutypa* infection. Based on information from other experiments, grapevine wounds appear to be susceptible only for two to three weeks after pruning, and the effect of the highly concentrated fungicide treatment on the identical apricot disease lasts for at least six weeks. Fresh wounds on one-year-old wood were found to be much less susceptible to *Eutypa* infection than fresh wounds on wood two years old or older.

The practice of protecting large wounds is economically feasible, because little fungicide is required, although hand painting or atomizing the wounds will increase labor cost. Spraying such a concentration of fungicide by conventional methods is not considered economical, and use of lower concentrations is ineffective in controlling the disease. Note that this treatment *will not eradicate the disease* from already infected vines. To achieve best results, annual treatment of any large pruning wounds should be made before any dieback is apparent in the vineyard. The use of Benlate on grapevines for this purpose is registered in California.

Benlate as a Pruning Wound Protectant

Inoculation treatment (1977)	*Eutypa*-infected arms (1979)
	%
1. No fungicide paint, inoculated day 0 with 100 spores	83.7**
2. Benlate paint at ⅓ lb/gal, inoculated a few hours later (day 0) with 100 spores	10.2
3. No fungicide paint, not inoculated (control)	14.6

**Treatment 1 is statistically different from the other two treatments at P less than or equal to 0.01. Treatments 2 and 3 are not statistically different

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