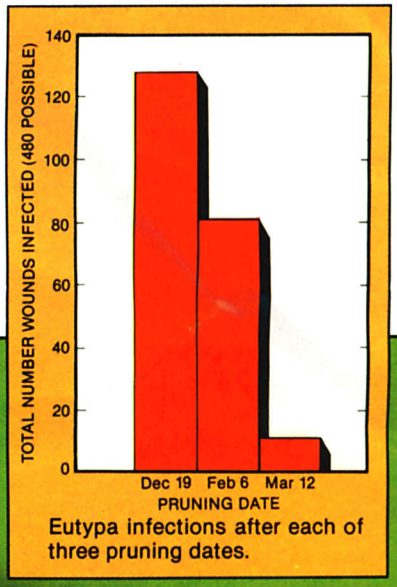
Grapevines show seasonal differences in susceptibility to eutypa

Curtis H. Petzoldt □ William J. Moller □ Mary Ann Sall



Eutypa infections after each of three pruning dates.

Early-winter pruning results in the highest probability of infection; March pruning, the least.

Vertical section of perithecial stroma in which *Eutypa* fungus spores are produced.

Eutypa dieback, a fungus disease of grapevine and apricot, was misdiagnosed on grapevine for many years because of the similarity of its symptom patterns with those of other pathogens. The fungus, *Eutypa armeniacae* Hansf. & Carter, was first thought to occur only on dead or dying plant material, but its role as the causal agent of a grapevine disease, later called eutypa dieback, was finally confirmed at the University of California, Davis, in 1978.

A range of other plants, of lesser importance agriculturally, are also affected, including several species of California "lilac" (*Ceanothus* spp.), chokecherry, and manzanita. All are components of the native vegetation. These plants are not usually pruned, unless they are used in landscape plantings. Since the fungus infects only through wounds, it is not likely that these landscape plants present important disease inoculum sources for vineyards and orchards. In other parts of the world, the fungus has been reported on dead wood of other woody trees and shrubs, and there may be inoculum sources as yet unidentified in California.

Eutypa spores, produced in masses of small, dark fruiting bodies (perithecia) on old, dead wood, are the source of infection. Perithecia are barely visible to the naked eye and can be seen only on the initially diseased pruning stub several years after infection.

In California, fruiting bodies have been found only in areas that receive more than 15 inches of annual rainfall. A rain greater than 0.05 inch (1.25 mm) causes fruiting bodies to discharge spores, which are then spread by wind currents to susceptible wounds on vines in freshly pruned vineyards.

Spore-trapping studies have shown that many spores can be detected during fall and spring rains. Generally, fewer spores are released with winter rains. Based on this information, it was suggested that pruning wounds made between late November and early January would result in fewer infections than those made in fall or spring.

Recent research, however, indicates that seasonal susceptibility of the pruning wounds as well as spore release patterns should be

taken into account when trying to avoid eutypa dieback infection. One-year-old, freshly pruned canes in a Thompson Seedless vineyard at Davis were used for the investigation. Canes were pruned on December 19, 1978, February 6, 1979, or March 12, 1979. Different groups of pruning wounds were inoculated one day after pruning, and at weekly intervals thereafter for three weeks. *Eutypa* spore suspensions in water were applied to each pruning wound at the rate of 1,000 spores per wound; controls received only water.

The rate of infection was determined eight months after inoculation by removing the canes and culturing the pathogen from tissues adjacent to inoculated wounds. Previous research had shown that culturing from the tissue below the wound after a few months was a good means of learning whether *E. armeniacae* was indeed growing in the cane, and that presence of the fungus was a valid indication of successful infection. Normally, it might take several years after infection for shoot symptoms to fully develop in grapevines.

Results showed that pruning wounds made on December 19 remained susceptible for a longer time than wounds made in February and March (see graphs below). Wounds made in December resulted in a high incidence of infection when inoculated up to two weeks after pruning. Wounds made in February, although highly susceptible on the day after pruning, rapidly lost susceptibility to inoculations made later. In March, wounds were barely susceptible, judging by the low level of resulting infections.

December pruning resulted in the most infections, March pruning the least, with February pruning midway between (see graph on facing page).

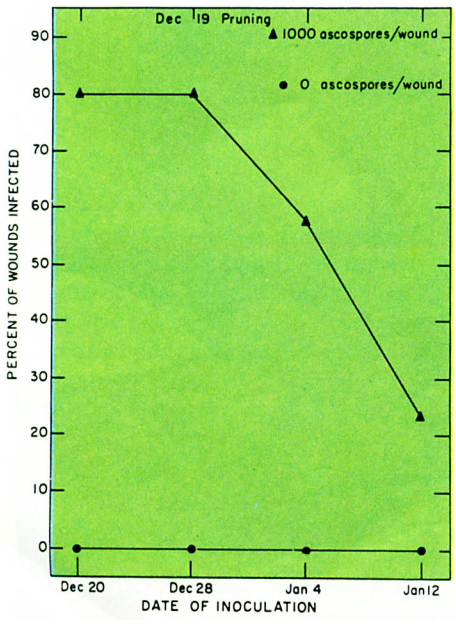
Conclusions

In this experiment on one-year-old grape canes, pruning in early winter resulted in the highest probability of infection with the eutypa dieback fungus. February pruning resulted in wounds that were initially highly susceptible, but lost susceptibility more rapidly than early-winter wounds. March wounds were barely susceptible to infection.

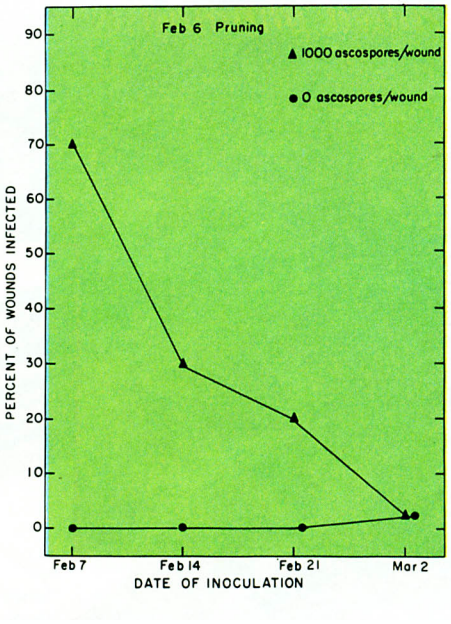
Previous research demonstrated that older grape wood is more susceptible than one-year-old wood pruned in February. Further research is in progress to determine whether older wood behaves the same as one-year-old wood during the entire dormant season (December to April). If so, it may be possible for growers to reduce disease frequency by pruning in late winter.

Eutypa dieback on Chenin blanc grapevine.

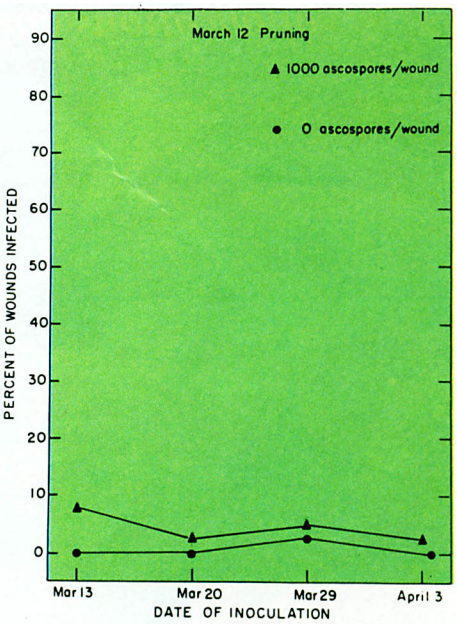
Curtis H. Petzoldt is graduate student, Department of Plant Pathology, University of California, Davis; the late William J. Moller was Plant Pathologist, Cooperative Extension, U.C. Davis; and Mary Ann Sall is Assistant Professor, Department of Plant Pathology, U.C. Davis. *Some of this research was made possible by a grant from the Wine Institute, San Francisco.*



Infection after December 19, 1978, pruning wound followed by *Eutypa* inoculation.



Infection after February 6, 1979, pruning wound followed by *Eutypa* inoculation.



Infection after March 12, 1979, pruning wound followed by *Eutypa* inoculation.