

eutypa dieback

Eutypa armeniacae Hansf. & Carter

INTRODUCTION

Eutypa dieback of grapevines, formerly called “dead arm,” was for many years thought to be caused by the fungus *Phomopsis viticola*. Recently, however, another fungus, *Eutypa armeniacae* (imperfect stage: *Cytosporina*), was shown to cause the cankers and dieback symptoms previously associated with “dead arm.” *Eutypa dieback* has been reported on grapes from several regions of the world and is also an important disease of apricot. *Phomopsis viticola* is still recognized as the cause of cane and leaf spot and occasional fruit rot.

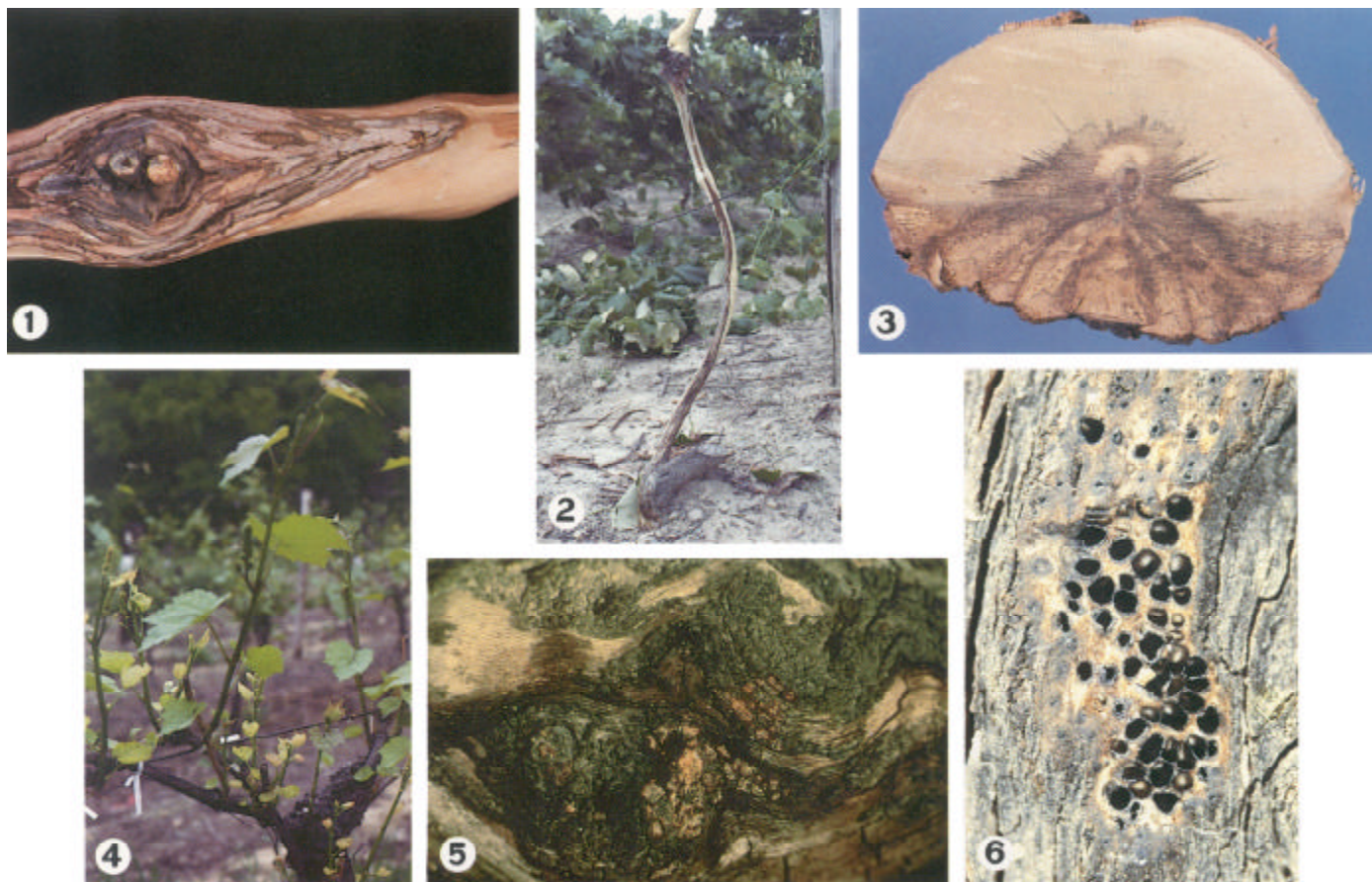
SYMPTOMS AND SIGNS

Eutypa armeniacae causes cankers on trunks and cordons (arms) of infected vines. Cankers are frequently found surrounding old pruning cuts. They may appear as flattened areas on the trunk and are usually concealed by dead bark. When the bark is removed the cankered area is

revealed as brown discolored wood bordered by white healthy wood (Fig. 1). The canker tends to expand longitudinally much more rapidly than laterally. Cankers on trunks can extend below the soil line, and cankers originating from an old infected trunk may extend from the base of adjacent renewal trunks up toward the head of the vine (Fig. 2). A cross section through the canker area usually shows a wedge-shaped area of darkened wood (Fig. 3).

Characteristic leaf symptoms develop on shoots arising from infected portions of the vine. As these new shoots begin to grow in the spring they appear stunted and have short internodes. The first leaves that unfold are small, cupped, and pale green to yellow (Fig. 4). The leaf symptoms are most obvious early in the growing season when healthy shoots are 12 to 24 inches (30-60 cm) long. Leaf symptoms become more pronounced each year until the affected portion of the vine dies.

After the bark weathers away from the canker area the fungus produces a hard black growth on the surface of the dead exposed wood (Fig. 5). This thin layer of black tissue is called a stroma, and within it, the fungus produces abundant flask-shaped fruiting bodies called perithecia which give the stroma a honeycombed appearance when cut through with a sharp knife (Fig. 6). If the stromatic tissue is then moistened, the contents of the perithecia absorb water, swell, and turn shiny black. The ascospores which spread the disease are produced within the perithecia.



DISEASE CYCLE

The disease cycle of *Eutypa* dieback is not complex but it requires a long time to complete (Fig. 7). Ascospores are released into the air from perithecia on dead stumps during periods of rain or snowmelt, and then land on fresh pruning cuts where they are washed into exposed xylem vessel elements (vascular system of the wood). Once inside, the spores germinate and infect healthy tissue. The wood dies, becomes discolored, and cankers are formed.

Two to four years after infection, stunted shoots with small cupped leaves appear. This symptom may be in response to a toxin or hormone produced in the canker and translocated up the vascular system to developing shoots. Shoots on infected vines, not directly connected to vascular tissue from the canker, develop normally. When the canker enlarges and spreads into the vascular tissue supplying more of the vine, more shoots will show symptoms.

After approximately 5 years, the bark weathers away from the canker and the fungus produces a stroma on the dead wood.

CONTROL

Infected trunks or cordons should be removed early in

the growing season when shoot symptoms of *Eutypa* dieback are most obvious. Trunk removal at this time is recommended because wounds are least susceptible to infection during the growing season and the availability of ascospores for reinfection is at a minimum. When the trunk or cordon is removed, the cut should be made well below the canker area in healthy wood. The cut surface should be protected from reinfection by painting with a wound dressing or an effective fungicide. If the canker has extended below the level from which shoots will develop for trunk renewal, the vine should be removed. Cut-out trunks and cordons should be removed from the vineyard and buried or burned to prevent ascospores from being produced on cankered wood. Furthermore, since old vine stumps left in the vineyard from previous removal practices frequently have the fungus sporulating on them and are sources of inoculum for new infections, they too should be destroyed.

The double trunk system of training, in which each trunk is pruned to carry half the number of buds, has been a useful system for minimizing crop loss from infected trunks. When one trunk must be removed because of disease, the remaining trunk can be pruned leaving the full number of buds until a second trunk can be reestablished.

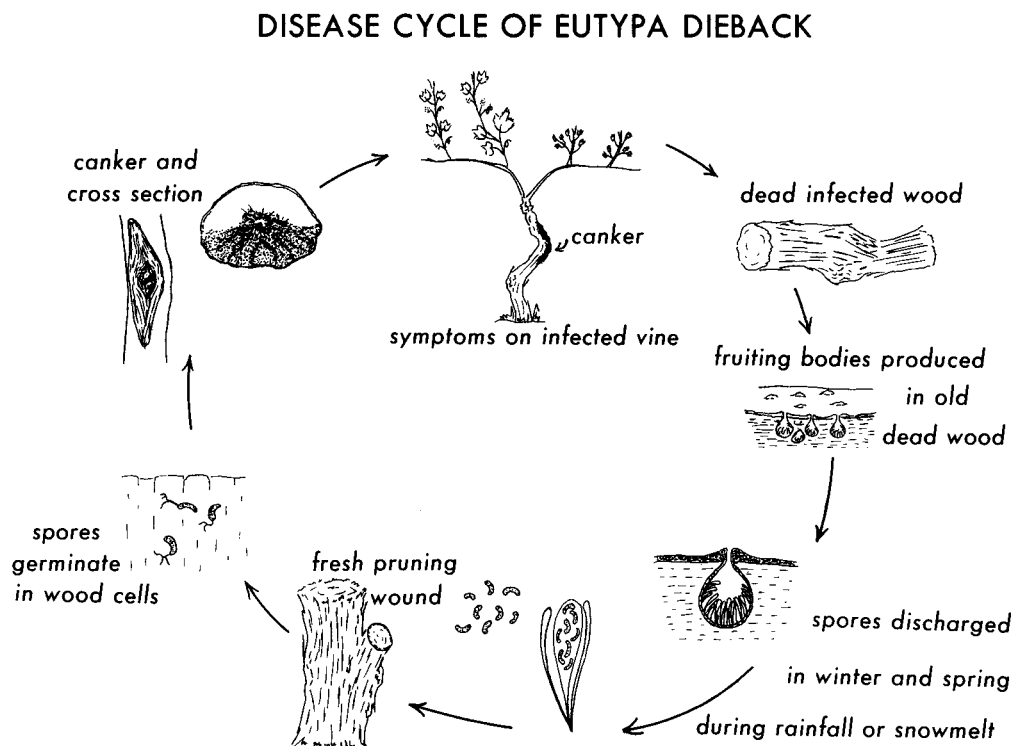


Figure 7