

## Eutypa dieback

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**Introduction:** Eutypa dieback, also known as dying arm and formerly known as dead arm, is one of the most destructive vascular diseases of grapes. Eutypa is a chronic wood-rotting, fungal disease that is uncommon in young vineyards, appearing when vineyards are over 8 years old. Eutypa is found in all regions where grapes are grown and is limited only by incidence of rainfall, favoring climates where mean annual rainfall exceeds 600 mm. The causal fungus can affect all grape varieties grown in Virginia as well as alternative hosts, such as apricots. Eutypa dieback was first observed in Virginia vineyards in 1991. In moderately to highly infected vines, yield losses due to vascular decay can be severe.

**Symptoms and signs:** Eutypa symptoms are most obvious in early spring when shoots are one to two feet long. At this stage, shoots on affected wood appear stunted with shortened internodes. Leaves are unusually small, yellowed, cupped downwards, and will often have necrotic spots or regions (Fig. 1). Leaf margins may appear tattered. Affected shoots are often observed on only one trunk of a multiple trunk vine or one cordon of a bi-laterally trained vine. Early season symptoms become less visible as adjacent, healthy shoots grow and obscure the affected growth.

Trunks or cordons below (in direction of the roots) affected shoots will have a canker or dead region of wood (Fig. 2) surrounding a large (nickel-size or greater) pruning wound and bordered by healthy wood. The canker or dead region may appear as a flattened area and may be concealed by dead bark, tending to expand more longitudinally than laterally. Removing the bark will reveal an area of dark, dead wood expanding in an elliptical pattern in both directions from the wound. Cankers can extend below the soil line and may extend from the base of a renewal trunk up to the head of the vine. A cross-section through an affected portion of the wood will exhibit a wedge (pie-



Photo by T. Wolf  
Fig. 1



Photo by T. Wolf  
Fig. 2

shaped area) of darkened, dead tissue with the “pie point” in the center of the wood (Fig. 3). The pie symptom is also a common symptom of *Botryosphaeria*; therefore *Eutypa* can only be diagnosed in conjunction with the foliar symptoms. The fungus within the canker produces a toxin, which is responsible for the characteristic foliar symptoms. These cankers will expand slowly over time and eventually kill the affected trunks and arms.



Fig. 3

**Pathogen life cycle and conditions of development:** *Eutypa* dieback is caused by the fungus, *Eutypa lata* (syn. *E. armeniaca*) and *Eutypella vitis* (syn. *E. aequilinaris*). Ascospores, released by perithecia in infected vines and alternative hosts during the year and at rainfall of more than 1 mm, infect pruned vines during the spring or the following winter. In regions where winter temperatures below 32°F prevail, dissemination of ascospores is greatest in late winter/early spring when grapevines are typically pruned. Infections occur when ascospores enter freshly pruned wounds in two-year old or older wood. This may be particularly frequent where trunks and cordons are being renewed, following winter injury. Rain or snowmelt is required for release of ascospores and entry into the open ends of xylem vessels exposed by pruning. Spores may be transported long distances by wind. Wounds are susceptible to infection for up to 4 weeks; however the period of infection is greatly reduced when cuts are made in warmer springtime conditions, possibly because wounds heal more rapidly. The likelihood of infection increases dramatically with nickel-sized or greater pruning wounds, and most cankers have been observed around cuts that were made through at least 2 year old wood.

Spore germination occurs rapidly but the mycelia (vegetative structure) proliferate slowly. Consequently, symptoms are not seen until three or four years after infection when a canker, as well as foliar symptoms, is apparent. Unless the infected portions are removed, the affected arm or trunk dies after several more years.

**Cultural control:** Based on removing infected wood.

- Remove infected wood from the vine and the vineyard making the pruning cut 12 or more inches below (proximal to) the lesion or point of infection (this may mean removing the entire vine).
- Burn or bury the 2-year-old or older wood to reduce availability of inoculum in the vineyard.
- Practice multiple trunk training systems to compensate for trunk losses. Delay the timing of large (into 2-year-old or older wood) pruning cuts until spring (no earlier than late March) or use double pruning to remove large sections of vine. Double pruning involves making two cuts to remove the intended portion of the vine. The first cut is made during routine winter pruning 9-bud positions above the ultimate point of removal. The vine is then flagged for later attention. At, or around, bud-break a second cut is made to the 2-bud position. With double pruning it is assumed that the first cut may have become

infected; however, because the fungi grow slowly the infected portions are removed during the second cut made when inoculum levels are lower and when wounds heal faster.

**Chemical control:** Based on applying a prophylactic fungicide or physical barrier to pruning wounds. See Viticulture Notes Dec 2003 ([2003 Dec](#)).

- At this time there is no fungicide labeled for wound protection.
- Use tree wound dressing, a soap solution, or anti-mildew paint on large wounds (nickel size or larger).

**Notes:** For more detailed information on Eutypa see Viticulture Notes: 1991 Dec., [2003 Dec](#)

Information on pesticides is also available by following the links at:

<http://www.ext.vt.edu/news/periodicals/viticulture/03january/03january.html>

**References:** see Viticulture Notes Vol Dec 1991, Dec 2003 and

<http://www.plantmanagementnetwork.org/pub/php/diagnosticguide/dieback/>

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