

Vineyard Trunk Diseases in California

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Does this look familiar?

All vineyards in California are likely to be infected with trunk diseases (a.k.a. wood-canker diseases). The main trunk diseases are Botryosphaeria dieback, Esca, Eutypa dieback, and Phomopsis dieback. The infections are chronic and accumulate over time. Farming vines with trunk diseases becomes less and less profitable with each additional year, to the point at which the entire vineyard must be replanted. In this way, trunk diseases significantly limit vineyard longevity.

Follow this guide to identify trunk diseases in your vineyard. It is not critical to identify the exact trunk disease because the management practices are the same and because they typically occur in mixtures of one or more trunk disease. What is important is that you:

- 1) Recognize trunk diseases as a problem,
- 2) Understand the preventative practices,
- 3) Adopt these practices in newly-established vineyards,
- 4) Do so on an annual basis throughout the life of the vineyard.

Do you have a trunk disease?

Look for these common symptoms, which are typical of all trunk diseases:



Figure 1: Dead Spurs



Figure 2: Stunted shoots



Figure 3: Wood Symptoms

Esca and Eutypa dieback have specific symptoms, which are diagnostic of these two trunk diseases:



Figure 4: Esca



Figure 5: Eutypa dieback

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Botryosphaeria dieback and Phomopsis dieback do not have specific symptoms. Instead, they are best characterized by the presence of one or more of the common symptoms listed above. That said, Phomopsis dieback is caused by the same fungus as Phomopsis cane & leaf spot (*Phomopsis viticola* or, according to its new name, *Diaporthe ampelina*), which does cause specific symptoms on the leaves. However, the relationship between the foliar symptoms of Phomopsis cane & leaf spot and the wood symptoms of Phomopsis dieback is not well understood. A vine can have one and not the other, which may be due in part to the fact that our California climate is rarely conducive to foliar infections by the fungus or to differences in strains that attack certain plant tissues.

Prevent Trunk Diseases



Double pruning can help prevent canker infection.

Photo Credit: Rhonda Smith

Trunk pathogens attack primarily through pruning wounds with rain during the dormant season. Susceptibility to infection depends in part on when the pruning cuts are made. Pruning wounds made early in the dormant season (December) are more susceptible to infection, in part because they can take weeks to 'heal'. In contrast, pruning wounds made late in the dormant season (February-March in the foothills) can heal within days, and thus resist infection soon after pruning.

There are no exact dates during the dormant season of high versus low susceptibility for the pruning wounds. This is mainly because of the dynamic nature of our annual rainfall and temperature patterns, and the fact that we do not know the ideal conditions for sporulation of the fungi or for speedy pruning wound healing. Regardless, what we can say with certainty is that the susceptibility of a pruning wound is highest at the start of the dormant season and lowest at the end.

Prevention of trunk diseases is focused on protecting pruning wounds. More often than not, vineyards are replanted before reaching their prime, either because no preventative practices are used or because they are adopted in a mature vineyard AFTER trunk diseases are widespread. What is critical is to start managing trunk diseases even in the absence of symptoms and in newly-established vineyards. Prevent trunk diseases BEFORE symptoms appear.

What to do in Newly-established Vineyards

Start preventing trunk diseases in newly-established vineyards and do so every year. The infections are permanent and there are no curative practices. Do not wait until year 10. Once you see symptoms, it is too late for prevention. Preventing trunk diseases in a young vineyard is like teaching your kids to brush their teeth. Sure, the baby teeth fall out, but the reason we start 4-year olds brushing is so they have good habits before their adult teeth arrive.

There are two approaches for preventing trunk diseases:

1) **Delay pruning until February-March.** If you prune either by hand or mechanically, to spurs or to canes, schedule pruning in February-March and not in December.

Double pruning - This is a type of delayed pruning, which is suited for cordon-trained, spur-pruned vineyards. It involves a 1st pruning pass, usually by a mechanical pruning machine, in December, which leaves all pruning cuts with canes that are approx. 8 or more inches in length. This is followed by a 2nd and final pruning pass in February or March, which leaves the 2-bud spurs and all final cuts down to the cordon. Because the pathogens grow relatively slowly, they are unlikely to grow from the pruning wounds at the tips of the 8-inch canes down to the cordon in between the two pruning passes.

2) **Prune in December and treat pruning wounds with a protectant for up to 1 month.** Pruning-wound protectants that have been tested and are labeled for dormant-season use against trunk diseases are Topsin and Rally. Other pruning-wound protectants are currently under examination. Regardless of the pruning-wound protectant, if you prune in December, the protectant must be active from when you make the pruning cuts up to 1 month after pruning. The labeled pruning-wound protectants Topsin and Rally are not active for 1 month, and so more than one application is required. Also, they must be reapplied after rain.

What to do in Mature Vineyards

Adopting the practices listed above will not eradicate trunk diseases. However, they may minimize disease spread, reduce further infections, and thus maintain productivity more so than if you do nothing.

There are two approaches for managing trunk diseases in infected vineyards, in addition to the two preventative practices listed above:

- 1) **Sanitation.** After removing symptomatic vines or pruning out trunks, cordons, or spurs of symptomatic vines, gather all infected wood and remove it from the vineyard or burn it. The spores can spread from this infected wood, but for some of the trunk pathogens, their spores spread very short distances (up to 6 feet max). Therefore, if you remove the infected wood from the vineyard, you can reduce the potential for new infections.
- 2) **Vine surgery.** Cut away infected cordons/ canes down to the trunk and retrain. The wood cankers are localized, and so if you cut them out, the plant is free of infection. This approach depends on cutting back far enough to where only healthy tissue remains. However, trunk pathogens are often present in healthy-looking parts of infected cordons/ canes, which is why our best advice is to recommend cutting all the way back to the trunk. This approach is labor-intensive and risky. It should be viewed as an absolute last resort. Also, be sure to protect the large wounds that are made to the trunk or to do vine surgery as late as possible, in February-March.

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