

## Disease Considerations at Pruning Time

Mizuho Nita

Virginia Tech

For pruning workshops in 2023



**What is the problem?** We often discuss diseases in green tissues, such as downy mildew; however, some pathogens infect woody tissues. Some examples are *Botryosphaeria* canker (as shown in the picture on the right), Petri disease (aka Esca), crown gall, and *Eutypa* dieback. In addition, other pathogens, such as *Phomopsis*, can cause disease in canes and cordons. Since these pathogens limit the movement of water and nutrients by infecting the xylem and phloem, typical symptoms of these diseases are the discoloration of leaves and shoots, the decline of the cordon, or even the whole vine. These pathogens act like a “silent killer” to shorten the vine's life by 5-10 years. Therefore, even if it may seem like you do not receive benefits immediately, preventative measures taken every year pay off in a more productive vineyard in the long term. On the other hand, with younger vines (up to 5 years or so), some of these diseases can progress rapidly to cause a decline of the infected vine within a year or two. For more on this topic, please visit our site (<http://treeandvinetrunkdiseases.org/>). On the same site, I have an online app to help you identify various trunk-related diseases and disorders. Please check it out (<http://treeandvinetrunkdiseases.org/trunk-disease-diagnostics-app>).

**Management: Environment and cultural practice.** Since grapevines have thick bark, there will be a low probability of these pathogens infecting healthy bark tissues, invading through the cortex, phloem, cambium, and xylem tissues. Instead, they are more likely to start an infection from exposed woody tissue, such as injury on the trunk or, as you might guess, through pruning wounds. The fungi and bacteria that cause diseases on grapes require a specific temperature range and, more importantly, a **wet surface**. Thus, if the pruning wound is dry, there will be fewer chances for the pathogens to infect the tissue. The rain will also help the pathogens to be dispersed; thus, it is crucial to avoid making wounds before the rain. Please check the weather forecast before pruning and ensure you will get sunny days to ensure the wounds will be dried out in a few hours and there will be enough time for the wound to heal.

It depends on other factors such as labor and your time, but if you can afford it, please pay attention to the timing of pruning. In CA, they recommend waiting as late as possible because, under cool weather, pruning wounds takes more time to heal. It may take up to two weeks under the low-temperature range (40's), and about one week in mild temperature (50's). The same principles apply to us. We have colder winters than in CA, and I would not expect pathogens to be active in the snow. However, it will take longer for wounds to heal.

Pruning surface shape and orientation are also important, especially when you make a big cut. If you make it flat and level, it can hold water. Thus, making a slant surface is recommended so rainwater will not stay on the surface.

**Double-pruning.** The idea is to do pruning in two passes where the first pass in winter or early spring to conduct rough pruning and then the second pass in late spring to do final pruning. It has several advantages. First, you do not need to spend a long time in frigid winter weather to perfect your pruning. Second, it takes less time when you do final pruning because you do not have to move long shoots from the wires in the second run. Finally, even if the first pruning wounds take time to heal and are infected, the second pruning will eliminate infected tissues.

**Sanitation.** We also recommend keeping the vineyard clean of debris. Many wood canker pathogens can survive on dead tissues, especially that of Bot cankers. Thus, it is ideal for removing pruned wood from your vineyard to be composted or to be burned. The other option is to bring

pruned wood to the row middles and run them over with a bush hog or a mower. Hopefully, it will speed up the rate of decomposition. If you make a significantly large cut, say re-training a cordon, it would be best to remove the old cordon from your vineyard. There is no benefit in keeping the large dead woody tissue, which can be the source of the inoculum, in or near your vineyard. Also, if you had an outbreak of black rot, which is, unfortunately, one of the common diseases in 2022, make sure to remove infected clusters from the vineyard. Dropping them off on the ground won't help since their spores can be airborne.

**Pruning equipment.** *It is not practical to clean your shears all the time*, but you can do it after pruning heavily infected vines and/or after several rows or a section. Your old trunk may be infected with the pathogens, which may have already produced spores that can be transferred from one vine to another. It will be very time-consuming, but what you can do is get 70% alcohol (rubbing alcohol) and spray it onto the pruners. Alternatively, make a 10% Clorox solution (10:90 Clorox: water solution) in a bucket and dip your equipment for 1-2 minutes.

**Chemical management strategies.** Pruning wound treatment has been discussed in various places and in different contexts. In California, where *Eutypa dieback* is a big issue, they tested a wound paste that contained boron. They used Biopaste, which was not a product available in the US, but we have a product called **B-Lock** (Nutrient Technologies, CA). Although it is unavailable locally, you can order it from Farm Supply Company in CA (<http://farmsupplycompany.com/cm/Home.html>), and they will ship it to you. Also, there is a product called **VitiSeal**, which contains essential oils. These pastes protect wounds from infection by *Eutypa* and *Esca*. However, *Eutypa* is a minor problem in VA. The survey of wood canker diseases by Dr. Phillip Rolshausen in 2008 did not find a positive *Eutypa* case from VA samples.

In addition to the pastes, two fungicide treatments have been registered. One is Topsin-M, and the other is Rally. These will be applied as paint-on or as a spray. Please see the labels for detailed rates and application information. One of the potential advantages of Topsin-M is that it works well against *Botryosphaeria*, which is very common in VA. To use these materials, you must obtain the latest labels. Please visit my blog (<http://ext.grapepathology.org>) and search for pruning wound treatments. It should take you to a post with recent labels for Topsin-M and Rally. Please note that Topsin-M has a 2-day REI. One tip is that the label of Topsin-M for pruning wound protection is for both paint and spray; therefore, you can mix B-lock and Topsin-M, if you wish to do so. Based on our preliminary research results, we found both Topsin-M and B-lock effective (but not Rally). However, the efficacy was inconsistent; thus, we need more investigations.

Regular wound paints, such as latex paints, are also commonly used. However, the consensus among growers, not only grapes but also other crops, is that these types of paint are ineffective. In addition, there was a study done with trees that showed that it might have a negative impact due to the trapping of moisture underneath the paint.

Lastly, I would like to mention *Phomopsis* cane and leaf spot. The pathogen of this disease infects canes in previous years and produces spores on it during the following growing seasons. Thus, if you have infected canes nearby new shoots, it will make it easier for the pathogen to infect it, primarily when the new shoot originates from beneath the old, infected cane because spores drip down from the old wound with rain. So, please pay attention to the relative orientation and distance between the infected wood and new shoots. Also, it gives you another reason not to keep old dead canes on your vines. There is an option to apply a dormant fungicide (Lime sulfur at 10% or Sulforix at 1%) against *Phomopsis*. Unfortunately, this treatment alone is not strong enough; thus, you still need the early-season mancozeb applications to protect new shoots starting when shoots are about 1 inch long.

**1. The first line of defense is a cultural practice**

- a. Keep pruning wounds dry
- b. Double pruning
- c. Wait for warm weather for the final pruning
- d. Keep vineyard floor clean
- e. Sanitize pruning equipment (esp. after a big cut)
- f. Consider pruning surface angle and orientation (esp. for a big cut)

**2. Chemical management options are also available**

- a. Topsin-M (or Rally) for Bot canker and Esca (recent labels are required)
- b. The B-Lock paste, which contains boron (known to work against Eutypa and Esca)
  - i. These options can come in handy, especially when you make a significantly large cut ( $> \frac{1}{2}$  inch cut)
- c. "Dreft" detergent with 30% aqueous suspension (wt/vol) showed efficacy against Eutypa; however, we do not have efficacy data on common trunk diseases in VA, such as Botryosphaeria canker