

Phomopsis cane and leaf spot

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Introduction: Phomopsis cane and leaf spot is a common early season disease in Virginia, with repercussions throughout the season. Referred to in Europe as *excoriose* and as “dead arm” in America before the description of *Eutypa dieback*, Phomopsis is widely distributed throughout the grape-growing regions of the world. Many common *Vinifera*, hybrid, and native cultivars are susceptible. The disease is most destructive in regions where grapevines are repeatedly wetted following budbreak. Phomopsis weakens vines, reduces yields and quality of grapes, and increases the severity of secondary rots.

Symptoms and signs: Phomopsis symptoms are commonly seen first in the spring as elongated lesions near the base of shoots on the first 3 to 6 internodes. The lesions are dark brown to black, can be deep, give the base of the shoot a dark, crusty appearance, and may not be observed until the shoots are several feet long (Fig. 1). Shoot lesions can coalesce and can also extend onto the cluster stem. Severely affected shoots are subject to wind breakage and stunted growth. The most significant result of shoot infections is the establishment of the fungus within woody portions of the vines, from which infections develop in subsequent years.

Phomopsis also causes leaf lesions primarily on the lower leaves of the shoot, and appear as small yellow or light-green spots with dark centers (Fig. 2).

Leaf lesions can drop out giving a “shot-hole” appearance. Severely affected leaves are distorted with a crinkle appearance, are smaller than normal, and may drop prematurely. Elongated lesions similar to those on young shoots may develop on petioles causing leaves to turn yellow and drop if severe.



Fig. 1

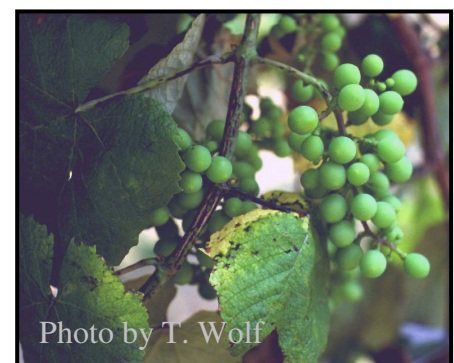


Fig. 2

Lesions on the rachises are sunken and black, causing the rachis to become brittle. Clusters may break at brittle points under the weight of the maturing berries or during harvest, leading to reduction of yield. If lesions girdle the rachis, berries below the infection site shrivel and may fall. Phomopsis can also cause fruit rot after berries begin to mature in mid- to late-summer preharvest period. Infected berries turn brown, often beginning where the berry is attached to the pedicel. Once completely rotted, pycnidia (spore producing structures) erupt through the skin, giving berries a rough texture. Berries eventually shrivel and are indistinguishable from the mummies caused by black rot.

Phomopsis symptoms may also be observed during dormancy. Dark, sunken lesions are visible on the lower nodes of canes and affected canes may appear bleached or whitish. These lesions contain very small, dark fruiting structures (pycnidia) which in the spring will produce spores to be washed by rain into young shoots.

Pathogen life cycle and conditions of development: Phomopsis cane and leaf spot is caused by the fungal pathogen *Phomopsis viticola*. *Phomopsis viticola* overwinters in its vegetative form as well as in pycnidia in the bark or canes. Spores are exuded from the pycnidia during wet periods of spring and splash onto young shoots. The spores infect young green tissues when temperature (40 to 45°F) and moisture conditions (several days of rain) are conducive to infection. Necrotic lesions appear 3 to 4 weeks later. Severe Phomopsis infections occur when weather conditions are appropriate, inoculum is present from past infections, shoots are only several inches long, and no protective fungicides have been applied. Phomopsis infections in green tissues are usually stopped by summer heat.

Berry infections occur through the pedicel during the prebloom period or through the berry epidermis following fruit set. Fruit infections that occur at or before the fruit set period and are followed by a period of fungal inactivity, where infections are typically not apparent until after veraison and are most visible 1 to 3 weeks before harvest. Fruit infections cause berry rots that can easily be mistaken for black rot or bitter rot. Rachis infections appear within a month after infection, are most pronounced during the preharvest period, and cause the most economic loss due to girdling significant portions of the rachis and berry shatter.

On shoots, the young growing tip is most susceptible to Phomopsis infections. Rachises are highly susceptible when clusters first appear and these infections are the most damaging. Rachis resistance begins to develop after fruit set.

Cultural control: Based on removing inoculum.

- Use proper pruning techniques and prune out as much apparently infected wood as possible.
- Do not leave dead spurs or pruning stubs on the vine (Spur-pruned cultivars have most frequent infection).
- Remove prunings from vineyard and burn or immediately chop prunings with a flail mower.
- Avoid planting in low-lying areas because poor air circulation favors infection.

- Use cultural practices that increase air circulation and improve drying.
- Consider hand-pruning instead of mechanical pruning to remove more old wood.

Chemical control: Protectant fungicides will be necessary for effective control where Phomopsis is present (2006 VT Pest Management Guide). Currently only two fungicides are recommended for Phomopsis control on grape in Virginia: captan and mancozeb. One or the other of these materials should be applied at label rates as soon as possible after budbreak and repeated as conditions warrant until after berry set. The most important period for rachis infection control is the first few weeks after cluster emergence. Repeated rains, cool weather, retarded shoot growth and heavy past Phomopsis incidence would all warrant tightening the protectant spray schedule to 5 to 7 days between sprays.

- Mancozeb (including Manzate, Penncozeb, Dithane, and others) formulations have a 66-day PHI during which time they may not be applied.
- Captan has a 0-day PHI but a 3-day REI with the newest formulation. Therefore, as harvest approaches captan should be used instead of mancozeb.
- Ziram also does well for Phomopsis control and only has a 21-day PHI.
- A dormant spray of lime sulfur may reduce overwintering inoculum of Phomopsis. When applying lime sulfur it is important to thoroughly soak the vines. Therefore tractor speed and spray volume should be adjusted. If vines are thoroughly soaked, this treatment may also reduce the overwintering spores of powdery mildew.
- Abound (strobilurin fungicide) and sulfur are also registered for Phomopsis control. Efficacy of sulfur is unknown in Virginia, although reports from California suggest using 10 lb sulfur per acre provides good Phomopsis control. Abound has not been shown to be as effective in controlling Phomopsis as mancozeb.

Please refer to the 2006 VT Pest Management Guide at <http://www.ext.vt.edu/pubs/pmg/hf3.pdf> for current information.

Notes: For more detailed information on Phomopsis see Viticulture Notes: 1991 Apr.; 1993 Apr.; 1997 Apr.; [1998 Apr.](#); [1999 Apr.](#); [1999 May](#); [2000 Jun.](#); [2001 Apr.](#); [2002 Jun.](#); [2003 Apr.](#)

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 Apr 1991, Apr 1993, Apr 1997, Apr 2003
 Pearson, R. C. and Goheen, A. C. 1988. Compendium of Grape Diseases. APS Press pg.17-20.
 Wilcox, W. 2005. Grape Disease Control. Dept. of Plant Pathology, Cornell University, NY State Agric. Expt. Station, Geneva, NY.