

Grapes 101

Phomopsis - Disease Biology and Management

By Raquel Kallas



Phomopsis infection on Niagara, girdling the rachis and resulting in loss of the cluster.

Phomopsis cane and leaf spot, *Phomopsis viticola*, is a fungal disease found in grape growing regions worldwide. The disease is especially prevalent in regions with frequent precipitation during the growing season, such as New York State. Up to 30% yield losses have been observed in vineyards with high inoculum levels in years with wet springs. Losses result from rachis (grape stem) infections that travel into the berries, and from the failed development of cluster wings. Although berry infections occur during the bloom period, the effects on the berries are not visually apparent until after veraison (color change) in August. Berries become necrotic and fall off of the rachises when they're touched.



Loss of the "wing" (lateral branch) on a Concord cluster resulting from Phomopsis infection during the early stage of cluster development (left), compared to a healthy cluster (right).

Symptoms and Disease Cycle. The asexual fruiting bodies of the fungus (pycnidia) appear as black spots and act as the overwintering inoculum that gives rise to spores (conidia). Spores produce the next generation of the fungus under the right combinations of temperature and precipitation. The vegetative growth (mycelium) creates mats on the outer surface of the vines' green tissue, from which more pycnidia and conidia emerge. The infections look like oblong black spots or striations on canes, shoots, and leaves. Infected berries are necrotic, and you can observe the pycnidia on their skins. These berries can be mistaken for berries infected by black rot, so it important to note when the infections became visible - black rot berry infections will typically occur earlier in the season and black rot infected berries remain tightly attached to the rachis.

Management. First, consider your cultivars' susceptibility. [NEWA has a susceptibility ratings list](#) that can help. Niagara, Concord, and Chardonnay are among the most helpless in the face of Phomopsis - don't let your guard down!

A combination of sanitation and fungicides is the solution to Phomopsis. Due to the relatively unique disease cycle that involves only one fungal generation per year, sanitation plays a critical role in management. By reducing the amount of infected wood in the vineyard, you can directly reduce the amount of inoculum for the current year, and subsequently, the amount of possible infection next year. As much old and dead wood should be cut off as possible, and burned or mulched and tilled into the row middles. Certain cultural practices, such as cordon-spur pruning, mechanical pruning, and pendulant training systems (e.g high cordon) can favor Phomopsis infection due to the abundance of inoculum that is maintained in the canopy. Phomopsis spores splash-dispersed by rain, so a single infected spur

(especially in a pendulant canopy) can be a well-positioned source of inoculum for spreading disease into the fruiting zone.



Black, elongated lesions caused by Phomopsis on the basal internodes and leaf petioles of Concord. A dead pruning stub (likely the inoculum source) is directly above.

There are few organic fungicide options available to control phomopsis. In the 2016 [Organic Production Guide for Grapes](#), Wayne Wilcox listed copper and sulfur as relatively weak against Phomopsis, but as the most effective materials accepted by organic standards. Translation: spray early and spray often, because there is little residual protective activity going forward. However, keep in mind that copper and sulfur are phytotoxic to some varieties - check the previously mentioned NEWA susceptibility ratings list for more information on which varieties are at risk. The other chemical control option for organic growers in wet climates is a lime sulfur spray before budburst. Aside from that, your only hope is religiously removing sources of inoculum from the vineyard.

Luckily, for those who opt for conventional control - in addition to sanitation, of course - it only takes a simple spray program in the early season to keep Phomopsis in check. Application of a broad spectrum protectant is critical during pre-bloom at 3-5 inches of shoot growth (ask your local Cooperative Extension Office for specific products available in your area). If there is a lot of rain through post-bloom, protective sprays should be continued. NEWA has [an extremely helpful Phomopsis infection model](#) to help you decide what kinds of conditions warrant a spray.

The Key Points about Phomopsis:

1. Unlike other grape pathogens, there is only one infectious generation per year – spore release starts at 3-5 inch shoot growth and ends at post-bloom.
2. Inoculum overwinters on canes, rachises, and in the crevices of bark on the trunk and cordons.
3. Spores are splash-dispersed by rain.
4. You can manage Phomopsis with confidence by minimizing sources of inoculum and by spraying protectants in accordance with the model found on NEWA: <http://newa.cornell.edu>

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