

PHOMOPSIS CANE AND LEAF SPOT

Phomopsis cane and leaf spot, caused by the fungus *Phomopsis viticola*, is an important disease of grape throughout the world. This disease is reported as “dead arm” in American literature. This disease is especially destructive in regions where the climate following budbreak may keep grapevines wet by rain for several days. It can weaken vines reduce yield, lower the quality of fruit for table use, and kill grafted nursery stock.

Symptoms

Small, light green or chlorotic, irregular to circular spots with dark centers develop on leaf blades (Figure 1). They may be puckered along veins near the perimeter, or the margin may be turned under. Dark brown to black necrotic spots may also occur along primary and secondary leaf veins and on petioles. The necrotic spots may drop out of the leaf, causing a “shot-hole” appearance.

Chlorotic spots with dark centers develop on young shoots, cluster stems, and petioles. As these spots enlarge, the infected tissues turn dark brown to black and appear as streaks and blotches. When infections on a shoot are numerous, they often coalesce to form dark blotches, which may involve much of the surface of the basal three to six internodes (Figure 2). During rapid growth of shoots, these dark, necrotic blotches often crack



Figure 1. Yellowing and necrotic tissues on leaves infected with *Phomopsis viticola* (Courtesy APS, W. B. Hewitt).



Figure 2. Lesions of *Phomopsis* cane and leaf spot on a shoot and rachis (Courtesy APS, R. C. Pearson).

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and become open fissures in the cortex tissue. Cracks in the epidermis and cortex of shoots tend to heal during the growing season and become rough as the tissues mature. Cluster stems may blight and become brittle from numerous infections, resulting in breakage of the cluster and loss of fruit. By midseason, symptoms become obscure because of the vine growth and leaf cover.

Green fruits can also be infected. However, the fungus remains inactive in the fruits as a latent infection. When fruits start to ripen, the pathogen becomes active and causes fruit to rot (Figures 3 and 4). Fruit rot appears close to harvest as a light-brown color. Black spore-production structures (pycnidia) of the pathogen and shriveling of berries occur. At this stage, *Phomopsis* fruit rot can be easily mistaken for black rot. It should be remembered that black rot symptoms develop long before harvest. Berries become resistant to infection by black rot fungus three to four weeks after bloom. Fruit rot symptoms caused by *Phomopsis viticola* generally do not appear until harvest.

Disease cycle

Phomopsis viticola overwinters as mycelium and pycnidia in bark. In spring, mature pycnidia erupt through the epidermis of canes, leaf petioles, and other dead, diseased parts hanging in the vine, as well as through cracks in bark on older diseased tissue (Figure 5).



Figure 3. Black fruiting bodies (pycnidia) on ripe fruit infected with *Phomopsis viticola* (Courtesy APS, R. C. Pearson).

When wet, spores exude from the pycnidia (Figure 4) and are washed or splashed by rain or shoot tips. Two kinds of spores (conidia) are produced, which are known as “alpha spore” and “beta spore.” Alpha spores measure 7-10 x 2-4 μm and beta spores measure 18-30 x 0.5-1 μm .

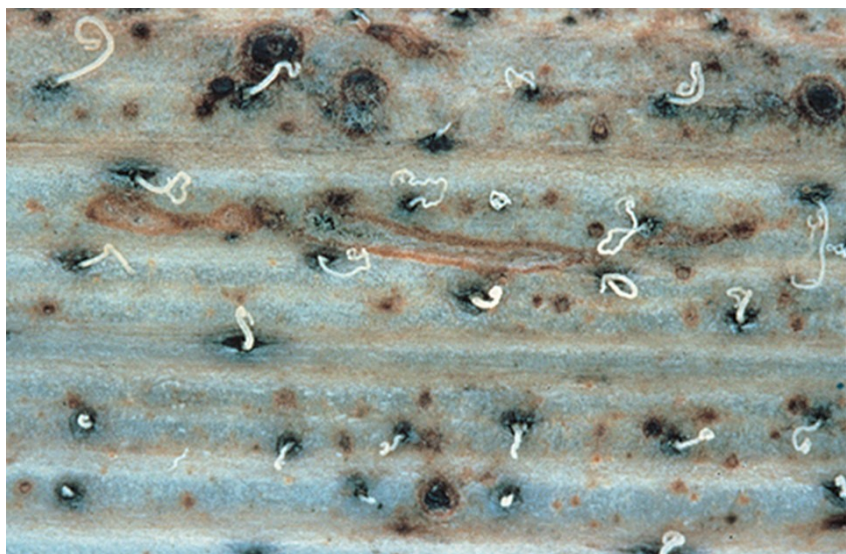


Figure 4. Pycnidia exuding spores of *Phomopsis viticola* in cirri on the surface of a one-year-old cane (Courtesy APS, W. Gartel).

Alpha spores germinate in a temperature range of 32-97°F, with optimal temperature of 73°F. Infection may take place within a few hours in free water or near 100% relative humidity. Only

young tissues are infected. Symptoms appear 21-30 days after infection. In summer in warm, dry climates, the fungus usually becomes inactive, but in fall as the season cools, it resumes activity. In cool climates, the pathogen may remain active throughout the growing season. Prolonged periods of rain and cold weather are prime factors in the development of an epidemic.

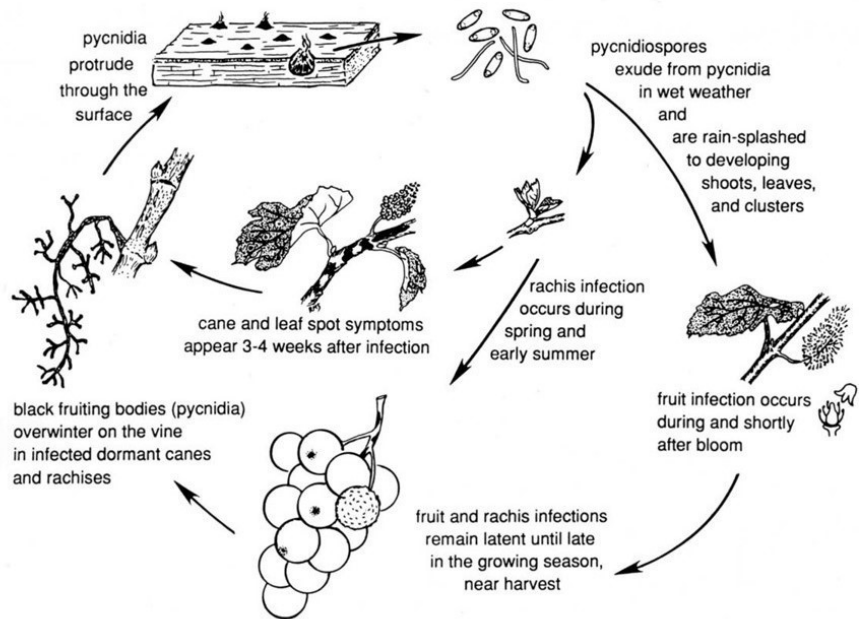


Figure 5. Disease cycle of *Phomopsis* cane and leaf spot of grape (Courtesy New York State Agricultural Experiment Station).

Because the pathogen spreads mostly within the vine rather than from vine to vine, spread within the vineyard is localized, remaining in close proximity to the inoculum source. Long-distance spread occurs by transport of infected or contaminated propagation materials such as budwood, cane cutting, and nursery stock.

Disease management

Phomopsis cane and leaf spot can be managed by combination of sanitation and fungicide application. To avoid introducing the pathogen into the vineyard, use pathogen-free propagation materials (cuttings, buds, rootings, and grafted or budded nursery stock) when planting or replanting. Once the disease has appeared, remove as much diseased and dead woods as practical during pruning. Destroy debris after pruning by shredding it, disking, or plowing it into the soil, or burning it.

Grape cultivars vary in their susceptibility to *Phomopsis* cane and leaf spot. Susceptibility may also vary with local conditions.

Fungicide application for management of *Phomopsis* cane and leaf spot in Illinois is common. For the update recommendations on using fungicide for managing the disease, refer to current issue of the Midwest Fruit Pest Management Guide, University of Illinois Extension - ICSG (<https://ag.purdue.edu/hla/hort/documents/id-465.pdf>).