

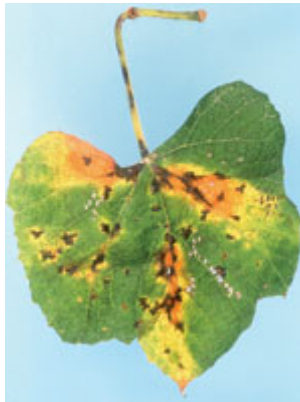
Phomopsis Cane and Leaf Spot–*Phomopsis viticola*

Grape Phomopsis cane and leaf spot, once called dead-arm disease, is a growing disease in the Midwest. In some states 30% crop loss has been reported in a growing season where weather conditions were conducive to pathogen growth. Fortunately, that level of damage has not been seen in Minnesota vineyards. Most crop loss is due to infection of the rachis and the berry.

It is important to note that for many years, phomopsis was thought to be the cause of a dead-arm disease. Researchers discovered, in 1976, that this disease was actually caused by two pathogens phomopsis, which causes the spotting phase of the disease, and *Eutypa dieback*, which causes the canker and shoot dieback phase.

Symptoms

Vegetative



Phomopsis on grape leaf (Photo courtesy of M. Ellis, Ohio State Univ.)

The most common symptoms observed in the field are those on the shoots of the vine. Chlorotic spots with dark centers spread over infected tissue and develop into black spots or elliptical lesions. These lesions tend to coalesce, when numerous, and appear as dark blotches covering as much as the first three basal internodes of the shoot. These lesions may make the shoots susceptible to wind damage, but they do not directly cause crop loss. It is important to understand that these shoot lesions are an extremely important source of inoculum for cluster and fruit infections in the spring.

Infection of the leaf blades appear as small, light green or chlorotic spots with dark green centers. Leaves may be puckered along the veins or the margins may be turned under. Dark brown spots can also appear along primary or secondary veins and petioles. These necrotic spots may drop out creating a 'shot-hole' effect on the leaf. Cluster stems are also infected causing blight or breakage.

Fruit

Fruit and the rachis can become infected throughout in the growing season, but are most susceptible in early spring. When the green fruits become infected they appear normal with the pathogen remaining latent. When the fruit starts to ripen closer to harvest, the pathogen becomes active causing the fruit to rot. The fruit will turn light brown and shrivel, resembling black rot infected fruit. It is important to remember that phomopsis symptoms appear at harvest, whereas black rot symptoms usually appear before harvest.

Disease Cycle

Phomopsis viticola, the causal agent of phomopsis cane and leaf spot, overwinters as pycnidia on infected wood between one and three years old. When the pycnidia are wet they exude spores that are washed or splashed to developing shoot tips. These spores germinate when temperatures are between 34-90°F (1-32°C). With an optimal temperature of 74°F (23°C) and

free water, or 100% relative humidity, infection can take place within a few hours. Symptoms will appear within 21-30 days after infection.

If there is a known problem in one area, it can become severe when rain continues for several days in early spring. When the temperature is between 41-45°F (5-7°C) shoot growth slows, causing any shoots between 3-10 cm to become very susceptible to infection. If the cool and wet weather is prolonged the pathogen can thrive and infection can spread causing an epidemic. With successive cool, wet springs, the inoculum will build up and infections will become more severe over time.

It is important to understand that the pathogen tends to spread within a vine, not from vine to vine so spread within the vineyard is localized. Long distance spread of phomopsis is normally caused by transportation of infected or contaminated propagation materials or nursery stock.

Control Strategies

The most efficient way to control phomopsis cane and leaf spot is the use of good cultural practices. Aeration is critical in controlling this pathogen. Pick a vineyard location with good air drainage and arrange the rows so that air movement after a rain is maximized. Establishing good ground cover in the rows and mulching under the vines will reduce splash dissemination and spread of the pathogen. Utilize pruning and training systems to improve air circulation which promotes rapid leaf drying and allows for full spray coverage and canopy penetration.

Phomopsis is viable in the field for several years. Due to this extended viability it is important to prune out and destroy any diseased parts from the vines or vineyard floor, during dormant season. Burning, burying or discing infected plant material will reduce overwintering inoculum in the vineyard. Use only pathogen-free propagation materials or nursery stock to avoid introducing infection into the vineyard.

If spray treatments are required, spring foliar applications are recommended when rainfall is predicted after budbreak. Sprays should be applied before the first rain after budbreak, before shoot length reaches 0.5 inches and again when shoots reach 5 inches in length. Contact materials, such as copper or sulfur, may need to be reapplied after significant rainfall.

There are not currently any phomopsis specific fungicides approved for organic certification. Most growers use a copper based spray, applied once or twice, early in the growing season. For the most current spray recommendations refer to the Ohio State University Extension web site, <http://ohioline.osu.edu/b861/>. Make sure to verify that each registered fungicide is permitted within the organic certification program.

References

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