

Anthracnose – *Elsinoe ampelina*

Grape anthracnose, also called 'bird's-eye rot', is a significant disease in regions with rainy, humid and warm climates. It is not a native pathogen to the U.S. and was most likely introduced via plant material imported from Europe in the mid 1800s. Anthracnose is economically important because it can reduce fruit quality and yield, as well as weaken the vine. It is a relatively minor problem in Minnesota vineyards.

Symptoms

Symptoms, expressed as lesions on shoots and berries, are most commonly seen by growers. Anthracnose infects the stems, leaves, tendrils, young shoots and berries.

Vegetative

Young, infected shoots develop small isolated sunken lesions with round or angular edges and a violet to brown margin. The center of the lesion may extend to the pith of the shoot and a callus will form around the edge. These lesions can cause shoots to crack and become brittle. Anthracnose lesions on shoots can be confused with hail damage; the difference is that anthracnose has raised black edges. Anthracnose infection on the petioles exhibits symptoms similar to the shoots.



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

Young leaves are most susceptible to anthracnose. Infected leaves develop many circular lesions with brown or black margins and round or angular edges. The centers will become grayish white and dry. The center tissue will eventually drop out of the lesion creating a "shot-hole" appearance. These lesions may coalesce and cover the entire leaf or develop along vein margins. If veins are infected, lesions will prevent proper development causing malformation or complete drying of the leaf.

Fruit



Anthracnose on grape berries
(Photo courtesy of M. Ellis, Ohio State Univ.)

Berry clusters are susceptible to anthracnose before flowering through veraison. Small, reddish circular spots develop first on the berry. They average $\frac{1}{4}$ " in diameter and may become sunken and have a narrow, dark brown to black margin. The center of the lesion begins as a violet color but becomes velvety and whitish gray over time. This coloration gives the pathogen its common name "bird's eye rot". Berry lesions can extend to the pulp, causing cracking and opening the berry to secondary infections. Lesions on the rachis and pedicels are similar to those of the shoots.

Disease Cycle

The causal organism of anthracnose is the fungus *Elsinoe ampelina*. Overwintering structures, called sclerotia, stay on infected shoots and produce many spores, conidia, in the spring when there is a wet period of 24 hours and temperatures above 36°F (2°C). The conidia are spread to other plant tissue by free water or rain over 2mm or more. These conidia will germinate, causing a primary infection when free water is present for 12 hours and the temperature is between 36-90°F (2-32°C). The higher the temperature the faster infection will take place. Disease symptoms will develop within 13 days at 36°F and within 4 days at 90°F. Ascospores, spores produced within a sexual fruiting body, also form on infected canes or berries left on the trellis or on the vineyard floor.

Asexual fruiting bodies, called acervuli, form on necrotic areas once the disease is established. These acervuli produce conidia in wet weather which are the secondary source of inoculum for the rest of the growing season.

Temperature and moisture are the key components in influencing disease development. Anthracnose can be very damaging during heavy rainfall and hail.

Control Strategies

The most efficient way to control anthracnose is the use of good cultural practices. Sanitation is a critical component in controlling anthracnose. Prune out and destroy any diseased parts from the vines or vineyard floor, during dormant season. This will reduce overwintering inoculum in the vineyard.

Avoiding susceptible varieties such as *V. vinifera* and some French hybrids, is also important in reducing the impact of anthracnose. Utilize pruning and training systems to improve air circulation which promotes rapid leaf drying and allows for full spray coverage and canopy penetration.

Since anthracnose can infect wild grapes, remove any plants near the vineyard. Wild grapes act as an excellent source of inoculum and the disease can develop unnoticed. If the wild grapes can not be removed from nearby wooded areas make sure to clear them from surrounding fence rows since conidia are easily spread by splash dissemination.

Implementing a properly timed spray program assists in managing anthracnose if it is established in a vineyard. A dormant application of liquid lime sulfur should be applied in early spring, prior to bud break. This can be followed by foliar applications of fungicides, from bud break to veraison, during the growing season. For the most current spray recommendations refer to the Ohio State University Extension web site, <http://ohioline.osu.edu/b861/>. In Minnesota, anthracnose is rarely a problem when a good fungicide program for controlling downy mildew is followed.

There is a limited variety of organic sprays allowed under regulation. Organic growers can use Lime Sulfur or copper sprays, as well as cultural practices, to control anthracnose. Make sure to verify that each registered fungicide is permitted within the organic certification program.

References

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