

Grape Anthracnose

The recent hot, wet weather in Arkansas has created the perfect conditions for several plant diseases to develop. One disease seen on grapes can lead to tattered leaves and characteristic 'bird's-eye' spots on the fruit. While not a problem every year for most growers, this disease, known as grape anthracnose, can become an issue when hot, wet weather occurs during the spring or early summer.

1. One withered fruit with anthracnose, and one ripe fruit with an anthracnose, 'bird's-eye' spot. (Left image)
2. Several fruit of a grape vine displaying symptoms of anthracnose. (Right image)



Photo by Clemson University



Photo by Katsunori Saito, University of Arkansas

Grape anthracnose, caused by the fungus *Elsinoe ampelina*, reduces the quality and quantity of fruit and weakens the vine. While this fungus can infect blackberries and raspberries, its primary host is grape plants. In particular, it is known to infect the native Ozark mountain grapes (*Vitis rupestris*), the fox grapes native to the eastern shores of the US (*Vitis labrusca*), and the European grape (*Vitis vinifera*). Native muscadine grapes (*Vitis rotundifolia*) can be susceptible to grape anthracnose as well.

The fungal pathogen, *Elsinoe ampelina*, can infect the fruit and all green tissue on grape vines. Temperatures between 75°F (24°C) and 79°F (26°C) are when the most rapid infections can occur, but the pathogen can cause infection anywhere between 36°F (2°C) and 90°F (32°C). Free water that remains for 12 to 24 hours on the fruit or green tissue from dew, fog, rain, or irrigation allows for initial infection. After infection, the warmer the temperature, the faster symptoms appear. At 36°F (2°C), symptoms will appear

around 13 days post-infection, while symptoms will appear in as little as 4 days when temperatures are around 90°F (32°C).

Young leaves are more susceptible to grape anthracnose than older leaves. Regardless of leaf age, the first symptoms of grape anthracnose are numerous small, chocolate brown, circular leaf spots. The spots eventually turn gray with round or angular margins that are brown to black in color. The gray, dead tissue may fall out of the leaf, giving it a tattered appearance. The spots may appear across the entire surface of the leaves or be focused mainly along the veins. Veinal lesions on young leaves will cause the leaves to grow unevenly and have a distorted appearance.

3. Anthracnose lesions on a mature grape leaf, some with their pale centers fallen out. (Left image)

4. Anthracnose lesions on a younger grape leaf. The lesions along the leaf veins have caused leaf curl and distortion. (Center image)

5. Anthracnose lesions on a young grape shoot. Some of the oval-shape lesions have coalesced. (Right image)

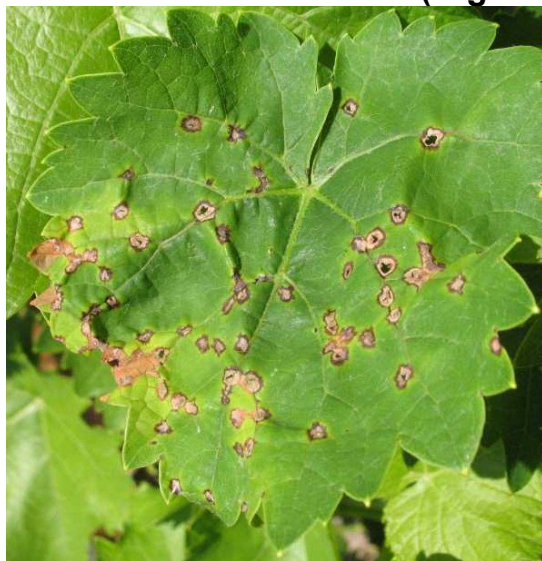


Photo by Missouri Botanical Garden



Photos by The Ohio State University

Green stems, vines, shoots, and petioles can develop small, oval-shaped spots that are purplish-brown in color due to the anthracnose pathogen. Before they die, young shoots may display distorted growth due to the damage caused by the lesions. These young shoots are the most susceptible to grape anthracnose. If lesions coalesce, they may cause enough damage to even kill older stems. Lesions on the older stems may develop sunken centers that are bleached or grey in color with darker colored borders and slightly raised edges. These lesions can be confused with hail damage. However, hail damage on grape stems will not have dark edges and should mainly cause damage to only one side of the

shoots and stems. Anthracnose lesions will more freely be distributed around the circumference of the shoots and stems.

5. Anthracnose lesions on a young grape shoot with sunken centers and raised edges



Photo by Sherrie Smith, University of Arkansas Division of Ag

Fruit afflicted with grape anthracnose will initially develop circular spots on the fruit that are red or purple-brown in color. The spots grow to approximately a quarter of an inch (~3.4 mm) in diameter and become slightly sunken and dry with a light-colored center and a dark margin. Singular mature infections can give a bullseye or bird's eye appearance to the fruit. During prolonged wet weather, the sunken lesion will develop pink-colored spore structures. Eventually, the fruit may shrivel up, sometimes causing the berries to crack. While some of the withered fruit can remain on the vine, most of the old, diseased fruit will fall off. Fruit are susceptible to infection from the time before flowering until the fruit stops growing and starts ripening (known in grapes as veraison). The younger the fruit, the more susceptible it is to grape anthracnose. Fruit symptoms caused by grape anthracnose differ from fruit symptoms caused by black rot. Black rot tends to rapidly cover half the fruit within 48 hours and mainly stays on the plant in a black, shriveled-up state rather than falling off.

Cultural practices are important in keeping the spread of grape anthracnose under control during warm, wet years. Infections can happen throughout the season as new grapes, shoots, and leaves emerge. Therefore, it is important to prune out infected fruit clusters, shoots, and stems as they are found during the season. Sterilize tools between cuttings using a 70% alcohol solution or a 10% bleach solution (1 part household bleach, 9 parts water). While the 70% alcohol solution is stable, the 10% bleach solution only remains effective for about 2 hours after mixing the ingredients, so be sure to create the solution shortly before pruning.

The fungal pathogen responsible for grape anthracnose, *Elsinoe ampelina*, overwinters on infected grape shoots and infected berries that have lingered on the vine or fallen to the ground around the plant. As such, it is important to prune out and dispose of infected

shoots and vines over the winter before budbreak the next year. An ideal time to prune is early in the winter after the vines have dropped their leaves. While pruning, search for any dried berries still on the vine and dispose of them. For infected berries and leaf debris on the ground, applying 2-3 inches (~50-75 mm) of soil, leaf mulch, or fine bark beneath the vines before budbreak will greatly reduce the potential of the debris to serve as a source of disease spread.

Disposing of any wild grapes in nearby fence rows or other wild areas will take away an important reservoir of disease and help protect cultivated vines. Cultivar choice can also help reduce disease incidence. Grape cultivars that ripen later in the year tend to get less anthracnose infections while grape cultivars with large, juicy berries are the most susceptible.

Another important cultural practice is to maintain good airflow through and around the grape vines. Keep any weeds and grasses cut short around the vineyard to reduce humidity. In the winter after the vines have dropped their leaves, select only a few strong, healthy vines from the previous year's growth and prune out the rest. If any infected vine branches are observed, be sure to prune them out and sterilize the tools after each cut on or near a diseased vine. During the growing season, train the vines, position the shoots, and remove leaves strategically to open up the canopy and encourage air flow.

For those that want to use chemical deterrents, liquid lime sulfur applied at a rate of 10 gallons per acre early in the spring before bud swell will greatly decrease anthracnose disease incidence. This high rate of application will burn any young grape tissue, so be sure it is applied early enough so as not to hurt any new grape growth in the spring. Because new growth is particularly susceptible to grape anthracnose, early season applications of fungicides are the most important for keeping infection at bay during a warm, wet year. A fungicide with the active ingredient mancozeb or captan can be used by homeowners in the spring as foliar fungicide. These fungicides deter anthracnose infections while also providing control of other common grape diseases such as black rot and downy mildew. It should be noted that without the lime sulfur dormant application, mancozeb and captan products likely won't provide enough control of grape anthracnose during a bad year. Organic growers may use sulfur fungicides that are approved for organic crops. Most commercial growers will already be suppressing grape anthracnose if they are following a regular spray schedule to protect against other common grape diseases.