



Pest e-alerts



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Downy Mildew on Grapes

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Now that many of the grapes have been harvested in Oklahoma, growers are likely sitting back, relaxing and enjoying some of last year's wine. I must say that this sounds like a good idea, but amongst the relaxation and recreational beverages, scouting for diseases should still be a priority. Several major diseases can be issues on leaves late in the growing season. If severe enough, defoliation of the plants can occur, inducing stress and perhaps increasing the risk of damage to overwintering buds.

Downy mildew, caused by the fungal-like organism *Plasmopara viticola*, is a pathogen that can cause stress to plants after harvest is completed. While generally not observed every year in Oklahoma, downy mildew of grape was recently reported in the Stillwater area. Typically considered a disease of actively growing and expanding "green tissues," downy mildew can still be a problem late in the season. Downy mildew is most damaging whenever factors exist that increase the moisture of soil, air, and the host plant. Rain events are considered the primary factor that drives the disease. When humid nights are followed by rain events the following day, the risk is high for downy mildew formation. Temperature also plays a role, but *P. viticola* can grow from temperatures of 50 – 85°F. Optimal temperatures are 65 - 72°F. Most severe epidemics have been noted when wet winters are followed by wet spring seasons and warm summers with rain events that occur every 8-14 days. Considering these moisture and temperature requirements, it is no surprise that we are seeing downy mildew on grape vines in Oklahoma this season.

Symptoms will vary depending on the age of leaf tissue. Newly developed leaves that are infected by *P. viticola* will often develop yellow lesions that are oily in appearance. More mature tissues will have an angular lesion that is yellow to reddish-brown and limited by leaf veins. On the lower leaf surface the cottony growth (mycelium) of *P. viticola* will often be readily apparent (Fig. 1). Viewing mature mycelium under the microscope will reveal the sporulating structures (sporangia connected to tree-like sporangiophores) of the organism (Fig. 2). These structures give rise to motile spores (zoospores) that can cause secondary infections.

P. viticola will over-winter primarily as thick-walled survival spores (oospores) in fallen leaves, but can also survive as mycelium in buds.



Fig. 1. Symptoms of downy mildew on the upper surface of mature grape leaves (top) and mycelial (fungal body) growth of *P. viticola* on the underside of mature grape leaves (bottom).



Fig. 2. Photomicrograph of mycelial growth and spore-producing structures of *P. viticola* on the underside of a grape leaf.

Management of downy mildew requires an integrated approach. Any practice that reduces moisture in the vineyard including improving soil drainage, orienting vineyard rows with the prevailing wind, and maintaining adequate weed control to increase air flow, will help reduce the severity of downy mildew. Proper dormant pruning and sanitation is imperative in order to reduce the amount of over-wintering inoculum. Fungicides will also be a part of the integrated program. However, fungicides should be applied as soon as possible after an infection event is assumed to have occurred (e.g. if temperatures are between 50 and 85°F, prevailing humidity has been high, and a continuous wet period of 24-hours has occurred). Some pesticides labeled for control of downy mildew include the strobilurin fungicides such as azoxystrobin (Abound), kresoxim-methyl (Sovran), or trifloxystrobin (Flint). Mefenoxam (Ridomil) is a member of the phenylamide group of fungicides and is considered one of the most effective chemical controls for downy mildew. Growers should be reminded that fungicide rotation is extremely important. Downy mildew is a high-risk pathogen for the development of fungicide resistance. Care should be taken to use several classes of fungicides in a downy mildew chemical control program, to prevent fungicide risk from occurring.

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