Cherry (*Prunus* spp.)-Powdery Mildew

- 
-

Latest revision:

March 2025

Severe powdery mildew infection of these cherries.

*Jay W. Pscheidt, 2000.*

Each of these cherries has a small powdery mildew colony near the stem end of the fruit.

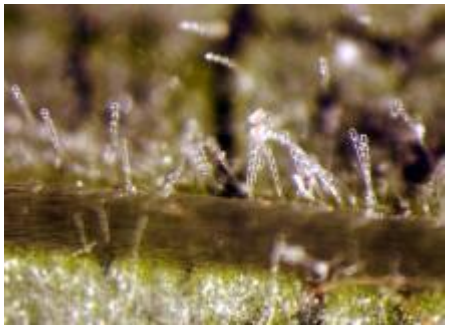
*Bob Spotts, 2009.*

A few colonies on the underside of the cherry leaf.

*Photo by Jay W. Pscheidt, 1989.*

Note the small black specks (cleistothecia) within the white area.

*Photo by Jay W. Pscheidt, 1997.*



Chains of spores are formed on conidiophones.

*Jay W. Pscheidt, 2019.*

A few colonies on the underside of the cherry leaf.

*Jay W. Pscheidt, 2016.*

See:

Cherry Cultivar Susceptibility

Cause *Podosphaera cerasi* (formerly *P. clandestina*), a fungus that most commonly infects young, expanding leaves but can also be found on buds, fruit and fruit stems. It overwinters as small, round, black bodies (chasmothecia) on dead leaves, on the orchard floor, or in tree crotches. Some chasmothecia may be trapped in bark crevices. In spring as buds break, irrigation or rain releases ascospores and wind spreads them to young leaves. When the right combination of air temperature and leaf wetness duration occurs, these ascospores start the first colonies of the season. Colonies produce more (asexual) spores generally around shuck fall and continue the disease cycle. Warm temperatures, high humidity, and dry leaves favor these secondary spores. The fungus can go from spore to new lesions, colonies and more spores in as little as 4 to 5 days under favorable conditions.

Ideal conditions for spread of the disease during late spring and summer are high humidity and temperatures from 70°F to 80°F. Vigorously growing trees with dense foliage encourages disease development.

The first few infections may be found on the leaves of sucker shoots, branches close to the ground, or leaves on main scaffold branches near tree crotches. Seedlings on the orchard floor may also be infected. Look for the first colonies about 1 week after the first irrigation. As leaves age they become more resistant to infection and disease development.

Unlike other fruit crops, flowers are not susceptible and young developing cherries are not as susceptible as older mature cherries. Conidia that land on green fruit may remain quiescent until later in the growing season. The exact trigger for fruit infection is unknown but specifically related to fruit maturity.

Major disease outbreaks are infrequent but potentially destructive particularly east of the Cascade Range. Most sweet and sour cherry cultivars are susceptible, but the disease is most severe on Bing. The cultivars Lambert, Regina and Black Tartarian have a moderate level of resistance while Chelan was found immune. Late season cultivars such as Sweetheart and Rainier seem more susceptible due to a longer growing season and more opportunities for infection. Chokecherry (*P. viginiana*) is not a host of sweet cherry powdery mildew.

Symptoms The first symptom is a light-green, circular lesion on either leaf surface. A subtle white cotton-like growth develops in the infected area. Mycelial growth can be sparse and difficult to detect. Early symptoms can be easier to find when the sun is over the back of your shoulder highlighting the colony. Severe leaf infection can result in curling and/or blistering, and leaves are covered with the characteristic white cotton-like growth. As infected leaves age, small, black bodies (chasmothecia) are formed.

Circular, slightly depressed areas develop late in the season on fruit surfaces. Symptoms gradually start at the stem cavity (stem/fruit attachment zone) and radiate out onto the fruit from there. A subtle white, cotton-like growth may or may not develop but can cover the entire fruit surface.

Cultural control Start looking for the first colonies about 1 week after the first irrigation.

- Remove and destroy sucker shoots.
- Keep irrigation water off developing fruit and leaves by using irrigation that does not wet the leaves. Also, keep irrigation sets as short as possible.
- Follow cultural practices that promote good air circulation, such as pruning, and moderate shoot growth through judicious nitrogen management.

Chemical control Begin at shuck fall and continue through harvest. Significant rain between budbreak and shuck fall warrants an application as soon as possible. Resistance to FRAC 3, 11, and 19 fungicides has been detected in eastern Washington and may also occur in mid-Columbia areas. Resistance to FRAC 7 fungicides is suspected. Alternate or tank-mix products from different groups that have different modes of action. Also, limit applications from any particular group to two (2) or fewer per year. Selection of products for rotation and/or mixing must consider FRAC 7 fungicides when used through the irrigation as a nematicide. Do not use fungicides at risk of resistance curatively when high populations of powdery mildew are in the orchard. A temperature-based computer model can help time reapplications. Do not use products on long 21-day intervals.

- Abound at 12 to 15.5 fl oz/A. Do not apply with silicone-based surfactants. May be applied the day of harvest. Sprayers used for Abound should not be used on apples. Fair efficacy. Group 11 fungicide. 4-hr reentry.
- Bicarbonate-based products. Might supplement a normal program when powdery mildew is first observed. Do not mix with acidifying agents. Thorough coverage is essential. Poor to moderate control alone. O
    - Kaligreen (82% potassium bicarbonate) at 2.5 to 3 lb/A. 4-hr reentry.
    - MilStop at 2.5 to 5 lb/A in the field or 1.25 to 5 lb/100 gal water in the greenhouse. Oregon and Washington only. 1-hr reentry.
    - Monterey Bi-Carb Old Fashioned Fungicide at 4 teaspoons/2 gal water. H
- Cabrio EG at 9.5 oz/A. May be used at harvest. Excellent efficacy. Group 11 fungicide. 12-hr reentry.
- Cevya at 5 fl oz/A. May be used day of harvest. Group 3 fungicide. 12-hr reentry.
- Cinnerate at 16 to 64 fl oz/100 gal water plus an adjuvant. 4-hr reentry. O
- Eagle 20 EW at 2 to 3 fl oz/100 gal water for home orchards or landscape use. Can be applied up to the day of harvest. Group 3 fungicide. 24-hr reentry. H
- EcoSwing at 1.5 to 2 pints/A. Can be used day of harvest. Group BM01 fungicide. 4-hr reentry. O
- Flint Extra at 2.5 to 3.8 oz/A. Do not apply within 1 day of harvest. 'Concord' grapes may be injured if accidentally sprayed. Group 11 fungicide. 12-hr reentry.
- Fontelis at 14 to 20 fl oz/A. Can be used day of harvest. Group 7 fungicide. 12-hr reentry.
- Gatten at 6 to 8 fl oz/A. Do not use within 3 days of harvest. Group U13 fungicide. 12-hr reentry.
- Inspire at 7 fl oz/A. May be used day of harvest. Group 3 fungicide. 12-hr reentry.
- Inspire Super at 16 to 20 fl oz/A. Tart Cherry only. Do not apply within 2 days of harvest. Group 3 + 9 fungicide. 12-hr reentry.
- JMS Stylet Oil at 1 to 2 gal/100 gal water. Do not apply micronized sulfur within 10 days of an oil application. Do not use oil within 14 days of a sulfur application. Do not use during freezing temperatures, above 90°F, or when plants are under heat or moisture stress. Do not use when foliage is wet as good coverage is essential. Do not use past pit hardening but may be used postharvest. Excellent efficacy. 4-hr reentry. O
- Luna Experience at 6 to 10 fl oz/A. May be used day of harvest. Group 3 + 7 fungicide. 12-hr reentry.
- Luna Sensation at 5 to 7.6 fl oz/A. Do not use within 1 day of harvest. Do not use if already used for brown rot. Group 7 + 11 fungicide. 12-hr reentry.
- Magister SC at 32 to 36 fl oz/A plus a surfactant only after all cultivars are past petal fall. Only one application allowed. Bees are very sensitive. Group 21A acaricide and group 39 fungicide. 12-hr reentry.

- Merivon at 4 to 6.7 fl oz/A. Do not use with EC or oil-based products. Only nonionic surfactants can be used within 14 days of harvest. May be used day of harvest. Do not use if already used for brown rot. Group 7 + 11 fungicide. 12-hr reentry.
- Miravis at 5.1 fl oz/A. Can be used up to the day of harvest. Group 7 fungicide. 12-hr reentry.
- Miravis Duo at 13.6 fl oz/A. Can be used up to the day of harvest. Group 3 + 7 fungicide. 12-hr reentry.
- Myclotect at 2 to 3 fl oz/100 gal water plus spreading agent. Can be used for home orchards or landscape use. May observe a PGR effect. Do not use within 14 days of harvest. Group 3 fungicide. 24-hr reentry.
- Oso SC at 6.5 to 13 fl oz/A. May be applied on the day of harvest. Group 19 fungicide. 4-hr reentry. O
- Ph-D WDG at 6.2 oz/A. May be applied on the day of harvest. Group 19 fungicide. 4-hr reentry.
- Prev-Am at 50 fl oz/100 gal water. Do not use with surfactants, above 90°F or when plants are under heat or moisture stress. 24-hr reentry.
- Pristine at 10.5 to 14.5 oz/A. Can be used day of harvest. Good to excellent efficacy. Do not use if already used for brown rot. Group 7 + 11 fungicide. 12-hr reentry.
- ProBlad Verde at 18.1 to 45.7 fl oz/A. Reapply if rain occurs within 12 hours of original application. Do not use within one day of harvest. Group BM01 fungicide. 4-hr reentry.
- Procure 480 SC at 8 to 16 fl oz/A. Do not apply within 1 day of harvest. Good efficacy. Group 3 fungicide. 12-hr reentry.
- Propiconazole-based fungicides are registered. Smaller, deeper green leaves and smaller fruit have been measured on trees treated multiple times during the growing season. Severe resistance reported in Washington. Fair to good efficacy. Group 3 fungicides.
    - Bumper 41.8 EC at 4 fl oz/A. 12-hr reentry.
    - Bonide Infuse Systemic Disease Control at 2 Tbsp/gal water. H
    - PropiMax EC at 4 fl oz/A. Do not use within 10 days of harvest. 12-hr reentry.
    - Tilt at 4 fl oz/A. May be used up to and including day of harvest. 24-hr reentry.
- Quash at 3.5 to 4 oz/A. Do not use within 14 days of harvest. Group 3 fungicide. 12-hr reentry.
- Quadris at 12 to 15.5 fl oz/A. May be applied the day of harvest. Sprayers used for Abound should not be used on apples. Group 11 fungicide. 4-hr reentry.
- Quadris Top at 12 to 14 fl oz/A. May be applied on the day of harvest. Sprayers should not be used on apples. Group 3 + 11 fungicide. 12-hr reentry.
- QuiltXcel at 14 fl oz/A. May be applied the day of harvest. Sprayers should not be used on apples. Group 3 + 11 fungicide. 12-hr reentry.

- Quintec at 8.7 fl oz/A. A surfactant is not required when used alone but a nonionic surfactant is preferred if needed for tank-mixes. Do not apply within 7 days of harvest. Good efficacy. Group 13 fungicide. 12-hr reentry.
- Rally 40 WSP at 2.5 to 6 oz/A plus another fungicide. Can be applied up to the day of harvest. Resistance reported in Washington. Fair efficacy. Group 3 fungicide. 24-hr reentry.
- Regalia at 1 to 4 quarts/A plus another fungicide. Use on 7-day intervals. May be used day of harvest. Does not benefit from the addition of an adjuvant. Group P5 fungicide. 4-hr reentry. O
- Rex Lime Sulfur Solution (28%) at 0.5 gal/100 gal water during fruiting season or 1 to 2 gal/100 gal water after harvest. Can be used day of harvest. 48-hr reentry. O
- Rhyme at 7 fl oz/A. Can be used through a drip or microsprinkler system. Do not use within 7 days of harvest. Group 3 fungicide. 12-hr reentry.
- Romeo at 0.23 to 0.91 lb/A. Avoid hot days and reapply after strong rains May be used day of harvest. Unknown efficacy in the PNW. 4-hr reentry. O
- Sil-Matrix at 1 to 4 quarts/100 gal water plus a nonionic surfactant. Can be applied up to the day of harvest. 4-hr reentry. O
- Spectracide Immunox Multi-Purpose Fungicide Spray Concentrate for Gardens at 0.5 fl oz/gal water. Can be applied up to and including the day of harvest. Do not use more than seven (7) times per year. Group 3 fungicide. H
- Sporan EC2 at 2 to 3 pt/100 gal water/A plus an adjuvant. Do not use when temperature equals or exceeds 90°F. May be used up to and including the day of harvest. Group BM01 fungicide. No reentry listed. O
- Sulfur-based products have good efficacy. Do not use within 2 weeks of an oil spray. Group M2 fungicides. 24-hr reentry. O
    - Bonide Sulfur Plant Fungicide (90% wettable) at 1 to 3 Tbsp/gal water. H
    - Microthiol Disperss (80% sulfur) at 10 to 20 lb/A.
    - Sulfur 6L (52% sulfur) at 5 gal/A.
    - Thiolux (80% sulfur) at 10 to 30 lb/A.
- Tebucon 45 DF at 4 to 8 oz/A. Can be applied up to and including day of harvest. Generally fair to good control. Group 3 fungicide. 5-day reentry.
- Tesaris at 3.5 to 5.6 fl oz/A. Do not use with oil-based products. May be used day of harvest. Group 7 fungicide. 12-hr reentry.
- Topguard SC at 14 fl oz/A. Can be used through drip or micro sprinkler systems. Do not use within 7 days of harvest. Group 3 fungicide. 12-hr reentry.
- Topguard EQ at 6 to 8 fl oz/A. Do not use with silicone surfactants or within 7 days of harvest. Sprayers should not be used on apples. Group 3 + 11 fungicide. 12-hr reentry.

- Topsin 4.5 FL at 30 fl oz/A plus another fungicide. Rotate with other fungicides to avoid buildup of resistant fungi. Do not use within 1 day of harvest. Group 1 fungicide. 2-day reentry.
- Torino at 6 to 8 oz/A. Do not use within 6 days of harvest. Group U6 fungicide. 4-hr reentry.
- Trionic 4 SC at 8 to 16 fl oz/A. Do not apply within 1 day of harvest. Good efficacy. Group 3 fungicide. 12-hr reentry.
- Vacciplant at 14 to 60 fl oz/A plus an effective fungicide. Can be used day of harvest. Unknown efficacy in the PNW. Group P4 fungicide. 4-hr reentry.
- Vivando at 15.4 fl oz/A. Do not use within 7 days of harvest or mix with horticultural oils. Group 50 fungicide. 12-hr reentry.

Note: Postharvest applications of oil has been shown to restrict chasmothecia development. Make applications 7 to 10 days after harvest.

Some registered products offer only suppression of this disease and thus are not recommended for use. These products include DoubleNickel 55 and Serenade Opti.

Biological control Begin at shuck fall and continue through harvest at 7- to 10-day intervals. Combine with cultural tactics and/or integrate with synthetic fungicides for best effectiveness.

- Aviv (*Bacillus subtilis* strain IAB/BS03) at 10 to 30 fl oz/100 gal water. Unknown efficacy. Pre-harvest interval not specified. 4-hr reentry. O
- Serenade Garden Disease Control Concentrate at 2 to 4 fl oz/gal water. Use only for blossom blight during bloom. H O
- Sonata (*Bacillus pumilis* strain QST 2808) at 2 to 4 quarts/A plus another fungicide. May be applied up to and including the day of harvest. Efficacy tests at Prosser, WA in 2004 were inconclusive. 4-hr reentry. O
- Stargus (*Bacillus amyloliquefaciens* strain F727) at 1 to 4 quarts/A plus a nonionic surfactant. May be used day of harvest. Unknown efficacy in the PNW. 4-hr reentry. O
- Theia (*Bacillus subtilis* strain AFS032321) at 1.5 to 5 lb/A. May be applied up to and including the day of harvest. 4-hr reentry. O

References Grove, G.G., Boal, R.J., and Bennett, L.H. 2000. Managing powdery mildew of cherry in Washington orchards and nurseries with spray oils. Online. Plant Health Progress doi:10.1094/PHP-2000-0728-01-RS.

Probst, C., Pandey, B., Swamy, P. and Grove, G. G. 2021. Factors affecting the infection of sweet cherry (*Prunus avium*) fruit by *Podosphaera cerasi*. Plant Disease, 105: https://doi.org/10.1094/PDIS-02-21-0229-RE.