

Pre-Harvest Disease Control in Cherry

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Two primary diseases that affect cherries during the summer season are cherry leaf spot and brown rot. Powdery mildew can also affect tart cherries in a hot, dry year such as this one. Major constraints to an economically viable cherry production in Michigan include adequate control of these diseases.

CHERRY LEAF SPOT. The fungus *Blumeriella jaapii* (Rehm) causes cherry leaf spot (CLS) in both tart and sweet cherries, although tart cherries show more susceptibility to CLS than sweets. CLS primarily infects leaves, but this disease ultimately decreases overall tree vigor and health. Purple lesions first show up on upper leaf surfaces, and eventually these spots turn brown. Wet weather causes whitish masses of conidia to grow on the undersides of the leaf in centers of the lesions. Often CLS appear as a one dimensional spot, surrounded by a light halo, on the top of the leaf, while the bottom-side lesion looks as if it is three-dimensional. A minimal number of lesions can cause the leaf to turn yellow and abscise. Trees severely defoliated prior to harvest produce light red fruit that have minimal soluble solids. These defoliated trees have difficulty forming buds and setting fruit for up to two years after severe infection; these trees are also less cold hardy and can die with low winter temperatures.

Chemical control. Cherry leaf spot control revolves primarily around fungicide applications as all cherry cultivars are susceptible to leaf spot. The first spray is usually applied as soon as the first leaves have unfolded. Sprays are often repeated on a 10-14 day (or 7 day alternate row) interval until harvest. There are many chemicals labeled for CLS, but MSU research from 2003-2004 has shown CLS to be developing resistance to one class of fungicides, the sterol inhibitors (SI's: Elite, Funginex, Indar, Nova, Orbit and Rubigan). This research suggests that Michigan growers need to shift from SI's to alternative chemistries for leaf spot control, which includes chlorothalonil (Bravo), strobilurins (Flint), strobilurin + Boscalid (Pristine), copper compounds, dodine, ziram, and captan. Bravo is the chemical of choice prior to shuck split and post-harvest, as this chemistry provides good CLS protection, and it does not have resistance potential. A tank mix of ziram and captan is an option for covers. Dodine is also an effective chemical where resistance has not yet occurred. Strobilurins work well against CLS, and Pristine is an excellent chemistry if powdery mildew is also a problem in the orchard. New research has also suggested that copper compounds are effective against CLS in tart cherries only. When using an SI, always tank mix with another chemistry, such as captan. For a complete table of recommended CLS control strategies, please see CAT Alert, May 3, 2005, Vol. 20, No. 4).

BROWN ROT. Warm, wet and/or humid weather is conducive to brown rot (*Monillinia fruticola*) development, and brown rot is a major disease of stone fruits. Sweet cherries are particularly susceptible to brown rot. Once the fruit begins ripening and changing color, it becomes more susceptible. This pathogen can gain easy access to fruit when any type of injury (insect damage, hail injury, bird pecks, bruised and/or cracked fruit, etc.) is present. Once the pathogen becomes established, soft brown spots appear on the fruit. These spots rapidly expand into lesions covered with powdery masses of creamy-tan colored conidia. Under favorable conditions, the entire fruit may rot within 48 hours. Eventually fruit that remains on the tree

dries out; these fruits are often referred to as “mummies”, and they become source for future infections.

Disease management. As it is true with any disease, reducing inoculum level will lower disease pressure. Control of blossom infection is important to minimize disease inoculum for fruit protection. Fruit injury should be minimized to reduce the fruit’s susceptibility to *M. fruticola*. Insect damage to the fruit should also be curtailed to decrease disease outbreaks.

Chemical control. There are several good fungicides that provide adequate control for brown rot disease. Protectants (captan, Wettable Sulfur) may be an adequate option in low-pressure situations. Materials from this group must be applied prior to the expected wetting event. Sterol-inhibitors (Elite, Indar, Orbit) will provide excellent control of fruit brown rot, but these materials should be used judiciously as resistance has been reported with these products in cherry leaf spot disease. SI products are best applied before the onset of the infection, but some of these fungicides have a limited back action of 24-36 hrs (Indar, Orbit). SI are again best applied in a tank mix with a protectant, such as captan. Strobilurins (Flint, Pristine) adequately control brown rot, and they are currently an option for fungicide resistance management. They must be applied prior to the wetting event since there are no available data as to their kick-back action. Other options are available for brown rot blossom blight control, such as Rovral and Bravo, that **cannot** be used for summer control.

POWDERY MILDEW. Tart cherries are particularly susceptible to powdery mildew (*Podosphaera clandestina*) during hot, dry weather. When mildew first infects young leaves, it looks like a whitish felt-like patch (mycelium) on the bottom of the leaf. The top of leaf usually boasts a wrinkle, and there is a halo-like appearance where the mycelium is growing on the underside of the leaf. These powdery lesions can spread quickly and can soon cover the entire leaf. Eventually, small brown to black globular bodies develop in the mycelium. Fungal spores are spread from leaf to leaf when temperatures hit 68 degrees F. Powdery mildew takes hold of an orchard when temperatures are high and moisture is generally low but spiked with times of high humidity. Mildew can spread rapidly throughout an orchard if inoculum levels are high. Heavily infected terminal leaves tend to shatter during mechanical harvesting.

Disease management. Increasing air flow in the orchard is the best cultural control for powdery mildew. Pruning trees to improve air circulation will create a less optimal environment for powdery mildew development.

Chemical control. Powdery mildew is often controlled with fungicide applications. Since this disease is most often a problem in hot and dry years, every season may not require a powdery mildew fungicide application. However, powdery mildew is important to control at the onset of the problem as this disease progresses rapidly and can overtake the orchard in a short amount of time. The disease is best controlled during the first cover to the pre-harvest period. Flint and Pristine are both excellent against powdery mildew. Nova, Rubigan, and Elite (SI’s) are all fair to good against mildew, but their use should be minimized due to resistance concerns. Sulfur provides some control of powdery mildew.