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How to Recognize and Control Brown Rot of Stone Fruits
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How to recognize and control

Brown Rot of Stone Fruits



Michigan State University
Cooperative Extension Service
East Lansing

Brown Rot of Stone Fruits

By E. J. Klos

Extension Specialist in Plant Pathology

Brown rot is the most serious fungus disease of peach, plum, and sweet cherry in Michigan. This disease can harm fruit in several ways: (a) reduce fruit set by blossom blight; (b) kill or blight twigs; (c) destroy part or all of a crop by attacking developing fruits (especially fruit injured by insects or hail); and (d) rot fruits on trees, in transit, or in the market.

Conditions Favoring Brown Rot Fungus

This fungus develops rapidly in warm (60-80°F.) weather. Infection takes place under wet conditions in 18 hours at 50°F. and in only 5 hours at 77°F. The crop is damaged most when these conditions prevail during bloom, and in the pre- and post-harvest periods.

Symptoms

Blossom blight: The infected blossom turns brown, shrivels, and dries up. (See Fig. 1.) The fungus may grow through the spur to the twig and form a canker.

Canker: At the base of the infected blossom spur or developing fruit, an oval sunken brown area shows up. Later the bark at the edge of the canker cracks, gum oozes out, and a callus forms. In some cases, the canker will girdle a twig.

Twig blight: Twig blight is often a result of canker girdling at the base of an infected blossom or fruit. The leaves blight, bleach, and then turn brown and die. Often the dead leaves remain on the twig.

Fruit rot: The first evidence of fruit rot is a small light-brown spot. This spot enlarges rapidly under the right conditions and will cover the whole fruit in a day or so. (Peach and cherry fruit turn brown, but on plum the disease is not so evident.) The infected areas then become covered with gray powdery masses (spores).

The fruit loses moisture, shrivels, and eventually becomes mummified (Fig. 2).

Life Cycle

The brown rot fungus overwinters in Michigan in three ways: (1) Infected fruits that drop to the ground and are partly covered by the soil. (2) Mummified fruits that hang on the tree. (3) Cankers developed from last year's blossom infection.

1. **Infected fruit that drops to the ground:** In the spring, the partly-buried infected fruit produce small vase-like bodies. The bodies (measuring $\frac{1}{8}$ to $\frac{1}{2}$ inch across the top) ripen at blossom time, shooting up millions of spores into the air. The spores drift to the opened or unopened blossoms, infecting them if the weather is wet long enough. Soon the infected blossoms wilt and become covered with gray masses of summer spores or conidia. Often the fungus continues to grow through to the twig bearing the fruit spur to form a canker. Later, conidia produced on these cankers are washed onto the growing fruit during rainy periods. It takes only a few cankers during warm, wet periods to produce enough spores to cause severe rot at fruit maturity.

2. **Mummified fruit in the trees:** During rainy spells, these fruit become covered with summer spores (conidia) that may cause blossom blight or fruit rot later. (See cover photo.)

3. **Twig cankers:** Summer spores (conidia) are produced on twig cankers in the spring during wet periods. These spores spread brown rot during bloom and later.

Spores produced on currently rotted fruit on the tree will infect other maturing fruit. The fruit rots during marketing as well as on the tree.

Controlling Brown Rot

Sanitation

Work in some states shows that if you pick up and destroy all infected fruit in the orchard for a number



Fig. 1. Note the dark, shrivelled, infected blossoms on the left twig.



Fig. 2. Peach mummies look like this in the tree during the dormant season.

of years, besides using the regular spray schedule, brown rot is easier to control. This practice is generally practical **only** in small isolated orchards. However, removing mummies from the trees is possible in commercial orchards.

Spray Application

Blossom sprays: The best insurance for successful fruit protection during ripening is complete control of BLOSSOM BLIGHT. Use two to four sprays of the recommended materials (see schedule) at 2- to 4-day intervals, depending on weather conditions. If rainy conditions prevail, spray more often until all the blossoms open and get protection.

Before-harvest sprays: Fruit must be completely covered with the recommended fungicides as they approach maturity.

Cultural Practices

Wider spacing and "opening" of trees to be sure of complete spray coverage and fast drying are a must in brown rot control. Where clean cultivation is practiced disking prior to bloom will lessen chance of spore production in the diseased fruit on the ground.

Insect Control

Controlling insects is important to brown rot control. Insect wounds make it easy for the brown rot fungus to get into fruit. See M.S.U. Extension Bulletin 154 for specific controls.

Chemical Control in Home Gardens

Spray weekly with either 2 tablespoonsful of captan or 6 tablespoonsful wettable sulfur per gallon of spray. Start when the blossoms start to open and continue until harvest.

Trees will need extra sprays during blossom and

Commercial Spray Schedules for Brown Rot Control

Time of application	Material per 100 gallons of spray		
	Peach	Sweet Cherry	Plum or Prune
Bloom (beginning with balloon stage and continuing through bloom).	At balloon pink: 2 gallons lime sulfur <i>or</i> ½ pound Phygon <i>or</i> 6 pounds sulfur paste <i>or</i> 5 pounds wettable sulfur.	4-6-100 Bordeaux <i>or</i> ½ pound Phygon <i>or</i> 5 pounds wettable sulfur <i>or</i> 6 pounds sulfur paste.	2 gallons lime sulfur <i>or</i> ½ pound Phygon (dichlone) <i>or</i> 6 pounds sulfur paste <i>or</i> 5 pounds wettable sulfur.
	Continue applications through bloom at 2- to 4-day intervals when wet, rainy weather prevails, using ½ pound Phygon <i>or</i> 5 pounds sulfur paste <i>or</i> wettable sulfur.		
Petal fall (when three-fourths of the petals have fallen).	If brown rot blossom blight has not been controlled, use 6 pounds sulfur paste <i>or</i> 5 pounds wettable sulfur.	1 pound ferbam plus 3 pounds wettable sulfur <i>or</i> 2 pounds captan.	1 pound ferbam plus 3 pounds wettable sulfur.
Shuck split (10 to 14 days after petal fall). Note timing under sweet cherry column.	Same as petal fall.	<i>First cover</i> same as petal fall.	Same as petal fall.
First cover (10 to 14 days after shuck split).	6 pounds sulfur paste <i>or</i> 5 pounds wettable sulfur.	<i>Second cover</i> (10 to 14 days after first cover) same as first cover.	Same as petal fall.
Second cover (10 to 14 days after first cover).		Third cover—Timing based on fruit fly emergence announced by county agent. 2 pounds captan <i>or</i> 5 pounds wettable sulfur <i>or</i> 6 pounds sulfur paste.	Same as first cover.
Third cover.	July 15 to 25. 5 pounds wettable sulfur <i>or</i> 6 pounds sulfur paste <i>or</i> 2 pounds captan.	Fourth cover—7 to 10 days after third cover and up to harvest—same as third cover.	1 month before harvest. 6 pounds sulfur paste <i>or</i> 5 pounds wettable sulfur <i>or</i> 2 pounds captan <i>or</i> 2 quarts lime sulfur plus 3 pounds wettable sulfur.
Fourth cover.	7 to 10 days after third cover. 5 pounds wettable sulfur <i>or</i> 6 pounds sulfur paste <i>or</i> 2 pounds captan <i>or</i> 2 quarts lime sulfur plus 3 pounds wettable sulfur.		10 to 14 days before harvest 2 pounds captan <i>or</i> 6 pounds sulfur paste <i>or</i> 5 pounds wettable sulfur <i>or</i> 2 quarts lime sulfur plus 3 pounds wettable sulfur.
Pre-harvest (spray at 7 to 10-day intervals from fourth cover until harvest).	Same as fourth cover.		

the pre-harvest period if the weather is warm and wet.

After bloom add 2 tablespoonsful of malathion and 3 tablespoonsful of methoxychlor per gallon of spray.

In the fall, rake up crop debris (leaves and fruit) from under the trees and destroy it by burning or burying.

For more complete information, see Extension Folder F-17, "Pest Control Program for Home-Grown Fruits."

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