

# Black Rot Disease in Apples – *Botryosphaeria obtusa* (Schwein)

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Black rot disease, caused by the fungus *Botryosphaeria obtusa* (Schwein), is concerning to homeowners with apple trees as part of their landscapes. All apple cultivars are susceptible to it, but it appears that McIntosh, Cortland, Empire and Northern Spy varieties are the preferred hosts. It seems that black rot is becoming more of a problem than usual. Normally, protectant apple scab programs would keep black rot in check. But, since incorporating other materials (like sterol inhibitors) that have no effect on these fungi, symptoms were more readily observed in the orchards throughout the state.

## Disease symptoms

Diseased limbs show symptoms that resemble fire blight. They appear as reddish-brown sunken areas with rough, cracked bark. The old cankers are dry and appear blistered, peeling and revealing black pimple-like, spore-carrying structures (Figure 1).

Leaf lesions start as very small purple spots. As they grow larger, there is a brownish-tan center with darker margins and a purple outline that resemble a frog's eye; this stage of disease is often referred to as frog-eye disease (Figure 2).

Symptoms on the fruit appear at the calyx end as brown/rotted lesions. As the lesions enlarge, they form a number of concentric rings (Figure 3).

## Disease cycle

Black rot overwinters in cankers on limbs, branches, trunks and mummified fruit left behind after thinning applications. The spores (conidia and ascospores) are released early in the season (bud swell) and continue to be released throughout the season. Conidia are produced during the wet periods and are spread by rain,



Figure 1. Black rot canker showing dry, blistered and peeling lesions revealing black, pimple-like, spore-carrying structures. (Photo credit: M. Danilovich)



Figure 2. Black rot leaf symptoms – frog-eye concentric lesions with a tan center and dark margins. (Photo credit: M. Danilovich)



Figure 3. Black rot fruit symptoms – note circles as the rot consumes the fruit. (Photo credit: M. Danilovich)

## Damage management

## For more information

wind and insects. The peak spore discharge is during the four to six week period post petal fall. This disease prefers relatively high temperatures. The temperature has to be above 48 degrees Fahrenheit. Optimum temperature is about 78 to 80 degrees Fahrenheit and requires only four hours of wetting for leaf infection to occur. It takes nine hours of wetting at temperatures between 68 and 75 degrees Fahrenheit to have fruit infection. Spores infect leaves, flowers, wounds on branches, the calyx end of fruits and trunks. Under heavy disease pressure, leaves may drop prematurely, predisposing trees to winter injury.

As with many other diseases, sanitation is one of the major factors. Remove mummified fruit, dead trees, dead or dying infected limbs. Prune out cankers to greatly reduce the amount of available inoculum. For homeowners, black rot can be controlled by starting a full-rate protectant spray program early in the season with copper-based products, lime-sulfur or Daconil. In commercial settings, apply one of the ethylene bisdithiocarbamate (EBDC) fungicides (Polyram, Manzate and Dithane). After petal fall, Captan at full rate, or a combination of Benlate and Captan, often used for powdery mildew control, will provide black rot control as well.

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