

LOUISIANA PLANT PATHOLOGY

DISEASE IDENTIFICATION AND MANAGEMENT SERIES



Bitter Rot of Apples

Colletotrichum spp.

The apple (*Malus domestica*) is a member of *Rosaceae* family and is known to have originated in Central Asia. It is grown worldwide, and the United States ranks No. 2 in apple production in the world (with China as No. 1).

Apples usually are grown in colder climates because of their requirement of a minimum number of hours between 32 and 45 F during winter (chilling requirement), which leads to them blooming in spring. But some varieties of apples, including Anna, Dorsett Golden, Ein Shemer and Ozark Gold (north Louisiana), may perform well with the mild Louisiana winters.

Several fungal and bacterial pathogens can cause diseases on both trees and fruits. Three fungal diseases – black rot, white rot and bitter rot – commonly are known to occur on fruit. Of these three diseases, bitter rot is the most destructive and can result in significant yield loss in commercial production.

All stages of fruit development are susceptible to fungal infection, but most infection occurs during midseason as the fruit approaches maturity. The

symptoms first appear as small circular brown flecks on the surface of fruit (Figure 1). As the disease progresses, slightly sunken, soft, watery and light to dark brown lesions develop (Figure 2). Later on, fungal fruiting bodies (acervuli) are produced in concentric rings on the lesions (Figure 3). During wet weather, large quantities of spores (conidia) in salmon-colored masses are produced from these fruiting bodies and result in secondary infection (Figure 4). The tissue subsequently rots, and the fruit shrivels into a mummy.

Bitter rot of apple is a fungal disease commonly caused by two species known as *Colletotrichum gloeosporioides* and *C. acutatum*. Both fungal species overwinter in mummified fruit and in dead wood and cankers. Spores are primarily dispersed by splashing water or rain. Infection may occur within five hours at an optimum temperature of 80 F. Disease develops rapidly under warm, moist conditions.

Management of bitter rot in both commercial and home landscape apple production requires an integrated pest management approach. Cultural

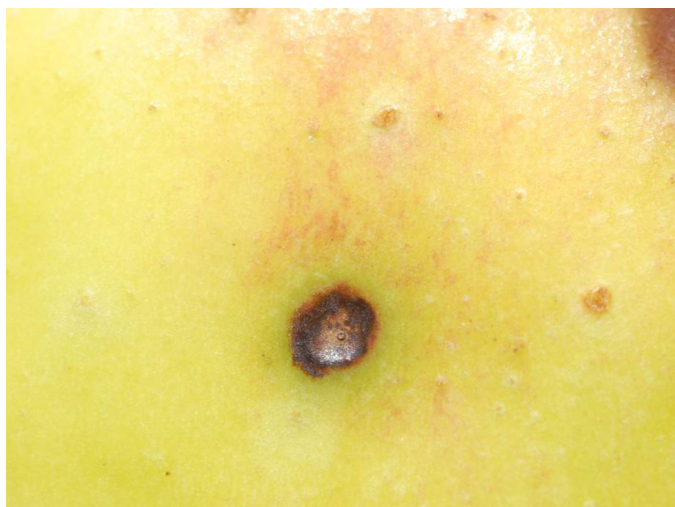


Figure 1. Fruit showing initial symptoms of bitter rot, including small circular brown flecks caused by *Colletotrichum* spp.



Figure 2. Slightly sunken, soft, watery and light to dark brown lesions on the fruit caused by *Colletotrichum* spp.

management practices that reduce diseases in home gardens and orchards play an important role in combatting bitter rot.

Growers and homeowners must practice good sanitation practices, including removal of mummified fruit from trees and the ground, pruning dead branches and twigs and removal of older and current-season fire blight infected branches to avoid fungal infection. If feasible, burn the pruned and diseased tissue or discard it properly. Removal of diseased fruit during the growing season is essential to reducing disease spread. Growers also should follow regular pruning and proper fertilization programs to improve tree health.

In home gardens, these cultural practices are the most effective ways to manage the disease. Protective fungicides used in conjunction with good sanitation practices are beneficial in managing the disease in commercial production. Several fungicides are available for commercial apple production, and growers are encouraged to follow the apple spray schedule recommended in the LSU AgCenter Plant Disease Management Guide.

For more information about plant health problems, visit our website: www.lsuagcenter.com/plantdiagnostics or call 225-578-4562.



Figure 3. Fruiting bodies of *Colletotrichum* spp. with salmon-colored spore masses produced in concentric rings on the lesions.



Figure 4. Diseased fruit exhibiting secondary infection from an older lesion on the same fruit.

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