

Michigan Blueberry Facts

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Alternaria Fruit Rot

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Pathogen

Alternaria spp.
(Kingdom: fungi; class: dothideomycetes)

Introduction

Alternaria species are an abundant, ubiquitous component in the environment and are a natural part of the fungal micro-flora. At least 20% of all agricultural spoilage is caused by *Alternaria* species. In a laboratory setting, *Alternaria* spp. can be easily identified microscopically by their characteristic small club-shaped spore and colony appearance on potato dextrose agar.

Alternaria spp. are the causal agent of Alternaria leaf spot and fruit rot in highbush blueberries. Alternaria leaf spot is currently not found in Michigan and has only been reported in North Carolina, however, fruit rot has been reported in almost all blueberry growing regions around the world.

Anthracnose and Alternaria fruit rot are the primary postharvest diseases of blueberry fruit; however, other rots can occur in the field. For more information about various fungal fruit rots please see the [Blueberry Fruit Rot Identification Guide \(E-2847\)](#).

Classically, Alternaria fruit rot is a primary issue when fruit is not harvested in a timely fashion and overripens on the bush. Alternaria fruit rot is a serious issue in postharvest situations and berries that are handled and packed wet or not kept cool during storage may be completely covered with the fungus by the time packed fruit reach the market or consumer.

Symptoms

Although not seen in Michigan, Alternaria leaf spot symptoms will appear in the spring after long periods of cool, wet weather. The leaves typically have tan to gray, circular to irregular lesions that are about 1 to 5 millimeters (about 1/8th of an inch) in diameter.

These lesions are usually surrounded by a red-dish-brown border. In most cases, only lower leaves are infected, but a severe infection can defoliate the plant.

In the field, sporulation by *Alternaria* spp. will often appear on ripe fruit, as sunken areas near the calyx covered with a dark green, velvety growth (Figure 1).



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Figure 1. *Alternaria* fruit rot symptoms seen prior to harvest. Notice the dark-green or blackish spores on the sunken lesion.

After harvest in storage, a grayish-green mold may appear on the stem scar or calyx end and quickly spread over the entire berry. Infected fruit becomes soft and shriveled (Figure 2). At 68 to 77 degrees Fahrenheit, infected fruit can decay within 10 to 20 hours and often exude juices and leak.



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Disease cycle

Alternaria overwinters in infected canes, old twigs and in plant debris on the ground. Studies have also demonstrated that *Alter-*

Figure 2. Post-harvest incubation of fruit under high humidity results in a fuzzy grayish green mold to form on the fruit surface.

Alternaria has a variety of alternate hosts that can serve as a source of inoculum for more fruit infections. In North Carolina, leaf infections occur in the spring during periods of cool, wet weather, and can serve as a vector for fruit infections in the summer. Fruit infections can occur prior to harvest with a low amount of incidence and appear to originate from the calyx cup as berries start to ripen.



Figure 3. *Alternaria* spp. growing on potato dextrose agar under sterile conditions.

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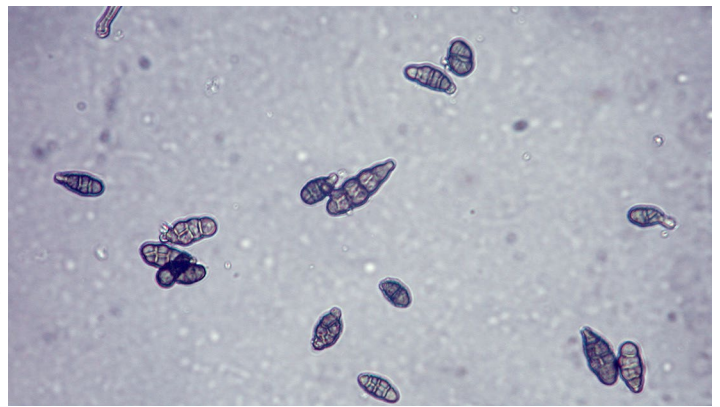


Figure 4. *Alternaria* spp. produces club-shaped spores that range from 7-15 micrometer in length and 15-55 micrometer in diameter.

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However, the majority of *Alternaria* appears in the post harvest environment, in experiments, 96% of *Alternaria* fruit rot infections occurred through the stem scar of the berry. This indicates that most *Alternaria* infections are not initiated until after fruit is harvested, because the stem scar is only exposed when berries are detached. Postharvest infections produce fuzzy mycelial growth on the surface of the berries. This fuzzy mycelium contains small club-shaped spores which are the best diagnostic feature for *Alternaria* spp. (Figures 3 and 4).

Management

Like other fruit rots such as anthracnose, *Alternaria* fruit rot does not become apparent until the first harvest, therefore, preventative measures are necessary to control the disease. A fungicide spray program from pink bud to harvest will prevent infection of blossoms and fruit. The Michigan State University

Extension [E-154 Fruit Management Guide](#) lists several fungicides that are effective against *Alternaria* including fungicides in Fungicide Resistance Action Committee (FRAC) codes 7, 9, 11 and 12. Of note, if a field has a disease history of *Alternaria* fruit rot, studies have shown that fungicides in FRAC codes 9 and 12 are extremely effective.

Cultural control measures are also extremely effective and should be aimed at making the environment less conducive for pathogen growth and development. For example, pruning bushes to create an open canopy allowing better spray penetration, good weed control, and timing of overhead irrigation to allow rapid drying of leaves and fruit. Timely harvests and rapid cooling and processing of fruit can reduce post-harvest losses. In the long term, pruning out old or infected canes and twigs can be effective at eradicating or reducing overwintering inoculum. Another option is to plant tolerant cultivars, such as Elliott, Draper and Aurora.

For more information about blueberry diseases and other important blueberry facts, please visit www.blueberries.msu.edu.

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