Extension Plant Pathology Black Rot Fact Sheet

November 2012

Black Rot of Cucurbit fruit – At the end of October, a butternut squash with classic symptoms on black rot was submitted to the NMSU-Plant Diagnostic Clinic or disease analysis. The fruit was incubated in a moist chamber and a few days later, *Didymella bryoniae*, was sporulating on the surface of the fruit. This pathogen is the causal agent of black rot. It is also the causal agent of gummy stem blight, a devastating disease of cucurbits in the field.

As a fruit rotting pathogen, Didymella bryoniae can be particularly damaging to winter squash (butternut, acorn, buttercup, hubbard, etc.) and pumpkins. Other cucurbits such as watermelon, cucumber, and grounds are also affected. The disease occurs worldwide in tropical, subtropical and temperate climates. It has also been reported in greenhouse production.

Symptoms – Black rot symptoms vary somewhat depending on the fruit affected. In winter squash, such as butternut, the symptoms may appear in the field before harvest, or while in storage. On butternut, a unique superficial, tan to white petrified area can develop in distinct concentric rings (Figs. 1 and 2). Black pycnidia, fruiting bodies, are embedded in the tissue (Fig. 3). If the fruit are damaged prior to or during storage, a brown to pinkish water-soaked area develops, followed by blackened areas with conspicuous fruiting bodies. In cucumber, before harvest, a black decay develops, especially at the blossom-end of the fruit. The decay may extend all the way into the pulp. After harvest, small, inconspicuous, water-soaked spots occur anywhere on the fruit surface. Under moist conditions, white mycelium of the fungus may grow on the surface of the lesions. As the lesions age, they darken as black pycnidia develop in infected tissue.

Figure 1. Black rot symptoms on butternut squash (Photo: Photo: Taylor Gobble, NMSU-PDC).

Figure 2. Close-up of black rot on butternut squash (Photo: Taylor Gobble, NMSU-PDC).

Figure 3. Dissecting microscope image of black rot sporulating on butternut squash (Photo: Natalie P. Goldberg, NMSU-PDC)

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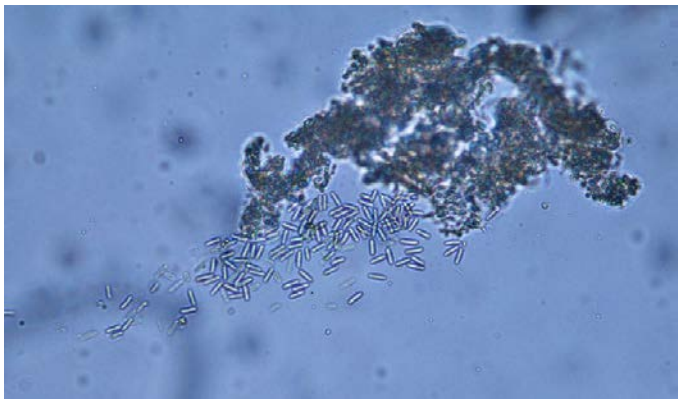

Figure 4. Spores of *Didymella bryoniae*, the causal agent of black rot on cucurbit fruit (Photo: Natalie P. Goldberg, NMSU-PDC)

On watermelons, distinct, circular, greenish tan to black spot appear anywhere on the fruit. The lesions have black centers and, under moist conditions, black pycnidia develop near the center of the spots. The lesions remain relatively smooth and moderately firm until they get quite large. The decay eventually penetrates the rind and rot consumes a large portion of the pulp.

Disease Cycle and **Conditions for Disease** – The fungus survives between growing seasons on infected plant debris. It may also be seedborne. The optimum temperature range for infection is 68 – 77 F, however, moisture is more important for infection than temperature. The fungus enters the fruit through wounds or through flower scars at the time of pollination. Fruit rot symptoms begin to develop about 3 days after infection.

Management – Black rot control should begin with effective control of gummy stem blight in the field. This will reduce the number of fruits lost during the season and provide better quality fruit for storage and transit. The use of treated seed should be a standard practice. In addition, a minimum of a two to three year non-cucurbit crop rotation is essential. In locations where gummy stem blight and black rot are common, protectant fungicide applications may be necessary to adequately control the disease.

Black rot is generally restricted in activity when fruit is stored between 44 and 50 F. Special care should be taken to avoid rind injuries to all fruit as wounds are entry sites for the pathogen. Rinds which are cured prior to storage are much less likely to develop disease. Curing at 68 – 77 F or higher for 1 – 2 weeks hardens the rinds. Fruit which have been cured may be stored at slightly higher temperatures (52 – 60 F) with relative humidity between 55 -75% with little risk of disease development.

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