Recognizing Fruit Rots of Vine Crops

Elizabeth Buck, Cornell Cooperative Extension, Cornell Vegetable Program

Phytophthora (fi-tof-thor-a) **is a serious, long-persistent, destructive disease that can easily be spread from farm to farm on infected fruit.** This disease can last a decade in the soil and attacks (blights/melts) vine crops, solanaceous crops, and legumes. The disease is caused by an oomycete, which is a different kind of organism from a fungus. Most fungicides don't control oomycetes. Growers with phytophthora have to rely on specialized control chemistries and often must make substantial changes to their production plans and planting systems. You do NOT want this showing up on your farm, especially not because of some rotting fall vine crops brought in from elsewhere.

Phytophthora loves cucurbit fruit. A single infected fruit can produce hundreds of thousands of spores. **Initial water-soaked spots enlarge and the lesions begin to grow a fine, powder sugar like mold that generally has a white or grayish color.** Once symptoms develop, fruit rot down fairly quickly. Secondary infections of opportunistic mold and bacteria can occur. Clean looking fruit from infected fields can develop symptoms after they are picked, packed and shipped.

Any farms with suspected phytophthora should contact CCE for positive identification and help drafting a management plan. Growers with cases in the field should not ship fruit with phytophthora. The high integrity move is to notify your customers that there is a risk of phytophthora developing on shipped fruit and advise your buyers to dispose of rotting fruit in the trash only.

If you believe you have received fruit with phytophthora, **DO NOT under any circumstances put that fruit into your field or cull on farm**. Phytophthora infected fruit should be bagged and put in the trash.

Top: pumpkin fruit with 3 water soaked and slightly collapsed phytophthora lesions in the center of the fruit. Lower left: three sporulating phytophthora lesions on a pumpkin. Lower right: Kabocha squash sowing advanced sporulation on the top and right side. Note the broad water-soaked band extending out from the sporulating area on the top. Photos: Pumpkins by M. McGrath, Squash by J. Ivison.

Anthracnose is a fungal disease that strikes foliage and fruit. I'm seeing a lot of anthracnose on fruit this fall. Anthracnose will progress post-harvest and cause losses in storage or after shipping. Anthracnose lesions can turn black and may eventually produce salmon-colored spores.

These three panels are showing early/mid stage anthracnose symptoms. Symptoms vary slightly across crops. On pumpkin anthracnose causes sunken, round lesions that develop black centers fairly soon. The second image, delicata squash, shows an age range of symptoms, with small lesions and older, sunken lesions that are pale in the center and have a reddish edge. The third panel is a close up of butternut squash showing the crusty, cracked, red-edged older lesion and two slightly blistered young lesions above and to the upper right. Photo credit: Tom Zitter.

Bacterial leaf spot was wide spread this summer on pumpkin and winter squash foliage following that very wet July. Now that harvest has arrived, fruit from those infected plantings are showing bacterial rot symptoms. Infected fruit have blisters with white centers that may hollow with age. A halo of water soaked tissue forms around the blisters. While these spots may seem to cause little structural impact to the fruit, marketing them is a risky proposition. Secondary rots often enter the rind through these bacterial lesions and lead to a (sometimes reeking) fruit collapse. Below are symptoms on a pumpkin (left) and immature butternut squash (right). Photo credit Meg McGrath.

Black Rot is the fruit-attacking form of Gummy Stem Blight; the same fungal disease has two names. Black rot will progress through storage or on a stand, so it pays to sort out fruit with early symptoms. With enough time, this fungal disease will eventually cause dark to black lesions followed by fruit decay. Decay often has secondary rots associated.

Any planting with gummy stem blight observed on foliage or vines is at high risk for black rot development on fruit, and should be scouted for signs of lesions. Early symptoms are less obvious and lack the distinctive black color. Lesions begin as watersoaked spots that develop into pits. Pitted lesions may sometimes have gummy, reddish exudate (sap) or may contain black specks. Lesions continue to grow and sink and will eventually darken. Butternut often has a unique presentation of concentric brown rings on the rind, particularly on the soil side of the fruit.

The photo panel below shows early to mid-stage symptom development on pumpkin (left), mid-stage classic sunken lesions on ripe butternut (center), and the concentric brown ring presentation on butternut (right). The lower photo shows the blackening and associated water soaking on a more advanced lesion on pumpkin fruit. Photo credits: A.F. Sherf, Tom Zitter, Tom Zitter, Meg McGrath.

Fusarium is a fungal dry rot that progress post-harvest. Fusarium is common in soils and so symptoms develop mostly on the underside of the fruit. Below is a progression of fusarium symptoms on pumpkin. The first symptom is light tan, circular spots or small, raised blisters that will develop wide, water-soaked margins with time (left). Those areas then sink (center) as the fungus progresses through the rind. Under favorable conditions the fruit produces pinkish and/or thick white mold (right). Photo credits: Meg McGrath and Tom Zitter.