EXTENSION
UtahStateUniversity

Vegetable IPM Advisory

UTAH PESTS

Pest and Production Update, Utah State University Extension, **October 14, 2014**

Fruit Rots of Cucurbits

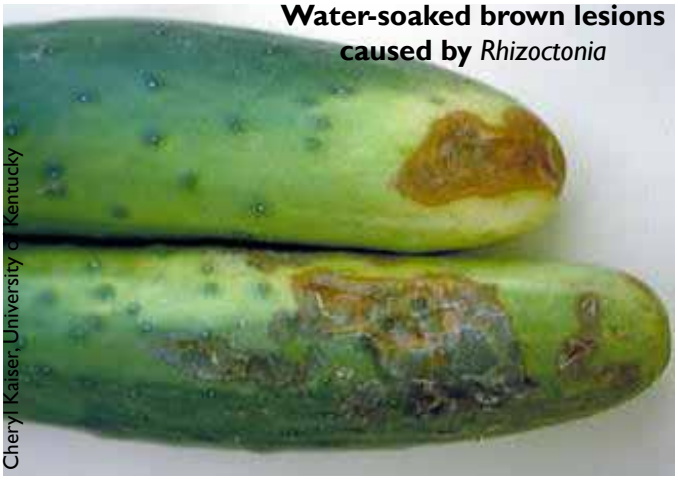
(Preharvest and Postharvest)

Belly Rot:

Belly rot begins on the underside of the fruit and is caused by *Rhizoctonia solani,* which is a common soil inhabitant worldwide. Rhizoctonia affects many plant species and can attack most plant parts. Although all of the cucurbits may be infected, cucumber is the most susceptible.

Symptoms:

Water-soaked, tan to brown lesions, which become sunken, cratered, irregular, and dried as they enlarge appear on the undersides and blossom ends of cucumber fruit. The cratered area has a crusty appearance that may be confused with symptoms of scab. Infection of cucurbit fruit usually does not lead to soft rot of tissue.



Water-soaked brown lesions caused by *Rhizoctonia*

Cheryl Kaiser, University of Kentucky

Disease Cycle:

The pathogen survives in the soil on plant tissue. Rhizoctonia invades cucurbit fruit in contact with the soil. Temperature is considered more important than moisture for disease development, although high relative humidity near the soil surface under dense foliage promotes infection. Infection can occur between 46° and 95°F. High proportions of fruit may be invaded at the optimal temperature of 80.6°F.

Control:

Fumigate and deep plow (7.9 to 9.8 inches) your field/garden before planting next spring. Use barriers such as plastic mulch, wire, asphalt shingles, or wood between the soil and produce to prevent fruits from coming in contact with the pathogen. Soil-applied fungicides may be used but generally do not control belly rot consistently.

For this information on belly rot plus more see University of Kentucky's plant pathology fact sheet http://www2.ca.uky.edu/agcollege/plantpathology/ext_files/PPFShtml/PPFS-VG-7.pdf

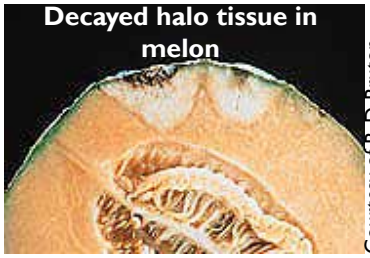
Fusarium Rot:

Fusarium rot is one of the more common preharvest and postharvest diseases of cucurbit fruits.

Symptoms:

Symptoms of Fusarium fruit rot symptoms can vary depending on the Fusarium species, the host plant, and the stage of lesion development. However, there are striking similarities in symptomatology among some Fusarium rots.

One group of Fusarium species produces brown internal lesions; a cross section of a mature lesion reveals a dry, brown, spongy rot with a white halo. In melon, lesions, which can be detected preharvest, generally remain green around the margin while the rest of the fruit begins to turn yellow at maturity. The disease is characterized by large cracks in skin. The net on the surface of the fruit is typically enlarged or thickened and is a dark tan. Diseased tissue can be easily removed since there is usually a distinct line between diseased and healthy tissue.



Decayed halo tissue in melon

Courtesy of B. D. Bruton. http://www.apsnet.org/

Decayed purple halo tissue in melon

Courtesy of B. D. Bruton. http://www.apsnet.org/

Another group of Fusarium species produces a distinct reddish or purplish pigmentation in the diseased area.

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Fusarium rot continued from previous page

Symptoms produced by the purple-pigmented species are essentially the same as the brown-pigmented species, with the exception of the pigmentation. In melon, there is often no sign of infection prior to harvest, but numerous spongy white lesions may develop internally postharvest. This type of lesion normally does not produce the brown coloration internally.

Another Fusarium fruit rot occasionally encountered invades the fruit through the stem end rather than through the skin like the other Fusarium species, which ultimately can contaminate the seeds. There may be slight or no outward symptoms of fruit infection and the internal symptoms are not characteristic of the other Fusarium rots. The most prominent symptom is a brown to purplish discoloration in the immediate area of the vascular bundles. The decay radiates out from the vascular bundles, and no pigmentation is conveyed to the fruit. The decay is firm and may appear somewhat white because of colonization by the fungus.

Courtesy of B. D. Bruton. http://www.apsnet.org/

Cucumber, honeydew, squash, pumpkin, and watermelon are less frequently affected by the preharvest phase of Fusarium rot. In postharvest Fusarium rot of honeydew, the pathogen produces light pink to cream-colored aerial mycelium, normally at the stem end or the blossom end. Internally the decay appears as a dry, brown, spongy rot with a white halo.

Courtesy of B. D. Bruton. http://www.apsnet.org/

The postharvest phase in cucumber and squash is normally associated with chilling injury or extended storage. Internally, the lesions remain white and spongy, and aerial mycelium may or may not develop on the surface.

On pumpkin, postharvest lesions can vary in appearance depending on the Fusarium species. Dry, pitted lesions are characteristic of Fusarium species while others commonly cause lesions with rapidly expanding whitish mycelium and may be sunken.

Disease Cycle:

Fruits of all cucurbits are susceptible to one or more species of Fusarium. The fungus may penetrate directly under moist or wet conditions, but may gain entry through wounds on fruits. Most infections of fruit occur in the region that is in contact with the soil. Although uncommon in watermelon fruit, Fusarium species can infect at the stem end and, less frequently, at the blossom end and belly. Fusarium rot is a fairly common fruit rot of pumpkin and squash, as both a preharvest and a postharvest disease. In cucumber, the postharvest disease tends to be more severe following chill injury. Fusarium rot is common in honeydew melons, occurring most frequently on the stem end. Natural infection of melon fruit by Fusarium species may be related to net development. Once callus tissue develops in the netted area (about 25 days), further infection is probably greatly reduced. Colonization of the tissue is slow until fruit maturity. Many of the fruit-rotting Fusarium species are reported to be seedborne.

Control:

Most infections of cucurbits by Fusarium species occur in the field (preharvest) and, to a lesser extent, during harvesting and handling. Fungicide applications for both pre- and post-harvest have been somewhat ineffective, because of difficulty in obtaining sufficient coverage of the fruit. Fungicides in combination with hot-water treatment have generally been more successful in controlling Fusarium fruit rot. The duration of immersion (1 minute) and the temperature (135°F) are critical for adequate control.
Keeping produce at proper storage and transit temperatures and avoiding wounding produce during harvest and packing can provide some protection against postharvest decay.

For this and more information about Fusarium rot see the American Phytopathological Society feature article at http://www.apsnet.org/publications/apsnetfeatures/Pages/FusariumRot.aspx

Phytophthora Fruit Rot:

Phytophthora capsici Leonian and other Phytophthora species cause a fruit rot that often occurs together with a crown and root rot, especially in summer squash. Environmental conditions determine the relative importance of the two phases: crown and root rot has a greater impact on summer squash yield under the dry conditions, whereas fruit rot is more important in humid conditions. Fruit rot is common in watermelon, although crown rot has not been observed. All cucurbits are susceptible; pumpkin and squash seem to be the most commonly affected.

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Phytophthora Rot continued from previous page

Symptoms:

The initial symptoms of Phytophthora fruit rot are a water-soaked or a depressed spot. The underside of the fruit, where it is in contact with the ground, is often affected first. Symptoms also develop on the upper surface of the fruit, especially following rain or irrigation which provides splashing water for fungal dispersal. The fungus produces a white, yeast-like growth especially under moist conditions, though this growth does not become very thick. Infections can progress rapidly until the fruit is completely covered and collapses. Symptoms also develop rapidly after harvest.

One of the initial symptoms of the phytophthora pathogen is water-soaked lesions on fruit

Disease Cycle:

The pathogen can survive in soil between crops for at least 2 years. Soil moisture conditions are important for disease initiation.

Control:

Rotate with non-host crops. Other hosts are pepper, tomato, eggplant, cocoa, and macadamia. Manage soil moisture by selecting well-drained fields, avoiding low-lying areas, sub-soiling, preparing dome-shaped raised beds for non-vining crops, and avoid over irrigating. Lengthening the time between furrow irrigations from 7 to 14 or 21 days may also be effective. Destroy diseased plants at the start of development and sanitize equipment between uses to prevent the disease from spreading. Fumigation and a preventive fungicide program initiated at the start of fruit formation may also provide effective disease suppression when combined with the above mentioned cultural practices.

Courtesy of M.T. Mcgrath, Cornell University.

Initial depressed spot showing signs of white fungal-like growth

For more information see the American Phytopathological Society feature article at http://www.apsnet.org/publications/apsnetfeatures/Pages/PhytophthoraFruitRot.aspx

Courtesy of M.T. Mcgrath, Cornell University.

Phytophthora can spread to cover the entire fruit causing it to collapse

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Insect Activity

Natural Enemies Spotlight: Ambush Bugs

What They Feed On:

Ambush bugs are predators of other insects and occasionally spiders. They lie in wait on plants and hunt by ambush, capturing prey that comes within range and injecting paralyzing saliva through their piercing-sucking mouthparts. Ambush bugs may forage among leaves but most commonly wait among flowers for passing prey. Both nymphs and adults feed on flies, caterpillars, beetles, wasps, bees, many flying insects often larger than themselves.

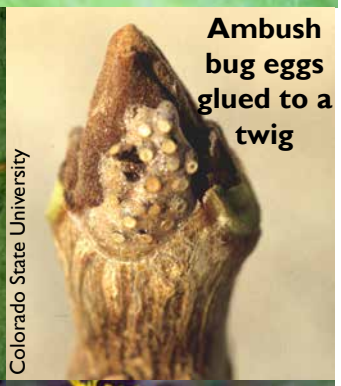
Appearance and Life Cycle:

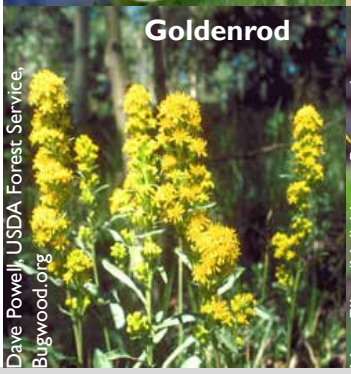
The ambush bug has a short and stout body of angular form and lacks a distinct "neck". Ambush bugs tend to be brightly colored, blending in with flowers and are quite variable in color ranging from cream colored to yellow-orange. They are also patterned with a dark abdominal band on the back and irregular blotch markings of light-brown to black. The front pair of legs are thickened and modified to grasp and hold prey, similar to those of a praying mantis. Ambush bugs also have a short beak that projects from the front of the head that they use to disable their prey. Adults are a bit smaller than a honey bee, and can vary from about 3/32 to 7/16 inch. Males on average are considerably smaller than females. Nymphs resemble adults but are smaller and wingless.

Ambush bugs overwinter as egg masses that are glued to twigs. Eggs hatch in mid to late spring and young nymphs initially feed on tiny midges and other small insects. They go through 5 immature stages before reaching the winged adult form and these early stages lack the markings of the winged adults. Development time can vary from 5 weeks to over 3 months to complete. Cooler temperatures can affect development rate but the availability of suitable food is also very important. Temperatures may also affect the incidence of dark pigmentation with nymphs. Nymphs that develop under cooler temperatures tend to become darker.

How To Attract Them:

Cultivate yellow and white flowering plants that bloom in mid to late summer, such as goldenrod and rabbitbrush, to provide their preferred hunting grounds. Avoid the use of broad spectrum insecticides.





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