Martin-Gatton
College of Agriculture, Food and Environment
Cooperative Extension Service

Plant Pathology Fact Sheet **PPFS-VG-07**

Fruit Diseases of Cucurbits

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Importance

Cucurbit fruit diseases can cause a complete yield loss in both commercial fields and residential plantings (Figure 1). Affected crops in the Cucurbitaceae family include cucumber, muskmelon (cantaloupe), pumpkin, summer squash, winter squash, and watermelon.

The major fruit diseases of cucurbits discussed in this fact sheet are belly rot, Choanephora rot, cottony leak (Pythium rot), Fusarium rot, and scab. Other cucurbit fruit rots (southern blight and Phytophthora blight) are discussed in separate publications (see Resources at the end of this publication).

Belly Rot

Hosts

Primarily cucumber; rarely other cucurbits.

Symptoms & Signs

Belly rot affects portions of cucumber fruit that contact soil. Immature fruit develop a yellowish brown, superficial discoloration, while infections of mature fruit result in large water-soaked, decayed areas (Figure 2A). Lesions eventually become sunken, dried, irregular spots on the fruit underside or "belly" (Figure 2B). Fruit remains firm, seldom succumbing to a soft rot.

Cause & Disease Development

Belly rot is caused by the common soil-borne fungus *Rhizoctonia solani*. This pathogen survives in soil and infested crop debris as fungal strands (mycelia) and firm, hardy survival structures (sclerotia). Excessive moisture, high humidity, and high soil temperate (above 68°F) are conducive to disease development. Under these conditions, symptoms and signs can become evident within 24 hours of infection, and fruit can decay rapidly.

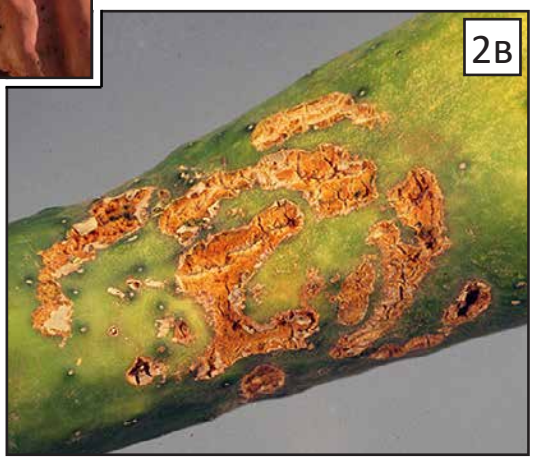

Figure 1. Cucurbit fruit rot diseases can cause yield losses in pumpkins, squash, and other cucurbit crops.

Figure 2. Belly rot primarily affects cucumber, resulting in lesions that are initially water-soaked (**A**), and later become sunken and dried (**B**).

Choanephora Fruit Rot

Hosts

Common on summer squash; may also affect cucumber and pumpkin.

Symptoms & Signs

Choanephora fruit rot first causes blossoms to suddenly collapse and decay (Figure 3A). Disease spreads to fruit, resulting in a rapidly progressing soft, watery rot at the blossom end. A profuse, fuzzy fungal growth with large masses of black spores forms on infected blossoms and fruit (Figure 3B). The pathogen's distinctive appearance, which bears resemblance to numerous small black-headed pins sticking out of a pincushion, is diagnostic for this disease.

Cause and Disease Development

The pathogen, *Choanephora cucurbitarum*, overwinters in soil on plant debris as dormant spore structures (chlamydospores and zygospores). Spores (sporangiospores) released in spring are spread to squash blossoms by wind, rain splash, and insects. This fungus infects blossoms and then spreads to the attached fruit; direct infections may also occur through wounds. High relative humidity and wet conditions encourage infections and disease development.

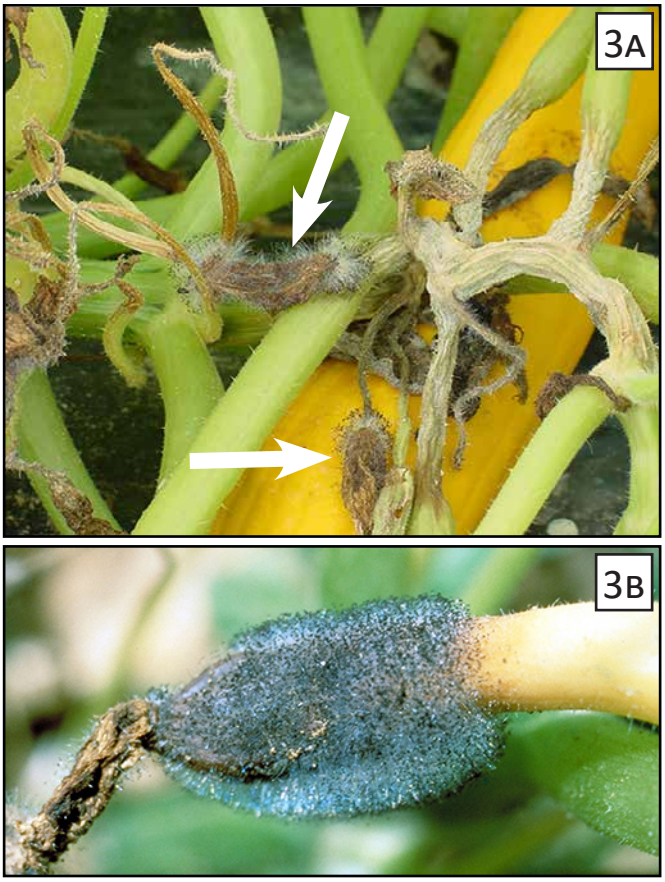

Figure 3. Choanephora infections often start with wilting blossoms (**A**) and progress to fruit (**B**).

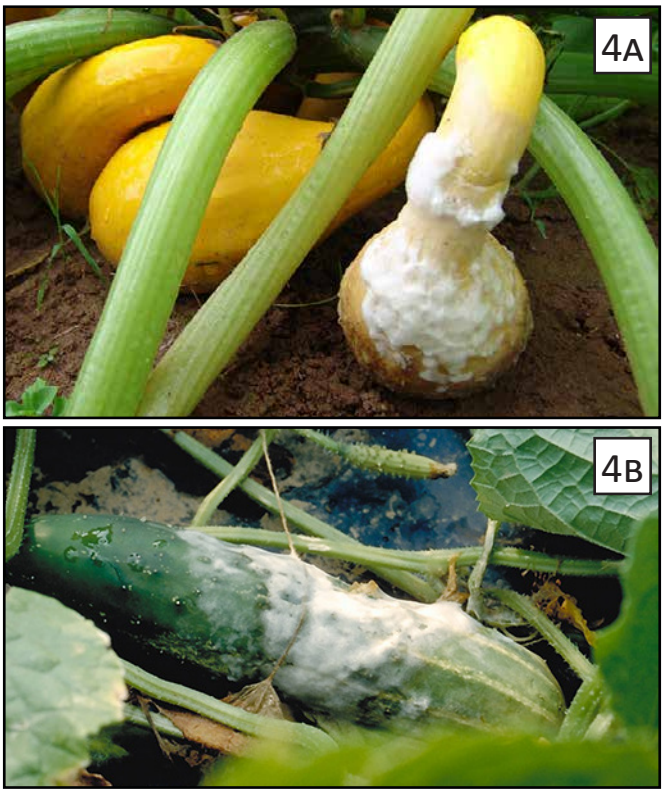

Figure 4. Cottony mycelium on summer squash (**A**) and cucumber (**B**) fruit affected by Pythium rot.

Cottony Leak (Pythium Rot)

Hosts

Most cucurbits; more common on cucumber and squash.

Symptoms & Signs

Cottony leak first appears on portions of fruit in contact with soil. Small, water-soaked spots expand rapidly until large portions of fruit are necrotic and soft. The watery rot may ooze or leak when the fruit is punctured. Profuse, white fungal growth resembling tufts of cotton (Figure 4) can be found on rotted areas when humidity is high.

Cause & Disease Development

Cottony leak is caused by *Pythium* spp. water mold pathogens, also known as oomycetes. These soil-borne organisms overwinter as dormant spore structures (oospores) in residue. Infection occurs through wounds or where fruit contact wet soil. *Pythium* spp. are easily disseminated via water and soil particles. Wet conditions promote infection and decay.

Fusarium Fruit Rot

Hosts
All cucurbits; particularly devastating on pumpkin.

Symptoms & Signs
Fusarium fruit rot begins as variously sized circular lesions (Figure 5A) that typically become sunken, and tissue beneath may be discolored and corky. Fungal growth (Figure 5B) on the surface of lesions is most often white in color but may be pink to purple.

Cause & Disease Development
Fusarium fruit rots are caused by *Fusarium* spp. These soil-borne fungi overwinter as fungal strands (mycelia) in plant debris or as thick-walled resting spores (chlamydospores). Infections initiated in the field prior to harvest may develop in storage.

Figure 5. Fusarium fruit begins as soft, circular lesions (**A**) that become sunken and are eventually covered with fungal growth (**B**).

Scab

Hosts
Cucumber, muskmelon, pumpkin, and squash.

Symptoms and Signs
Scab begins as small, sunken spots on fruit (Figure 6A) that later become covered with olive-green masses of spores (Figure 6B). Leaves and stems may also be affected, but the greatest losses occur when fruit are infected. Secondary pathogens may invade lesions, leading to fruit rot.

Cause and Disease Development
The pathogen, *Cladosporium cucumerinum*, overwinters in cucurbit vines left in the field or garden; it can also be seedborne. Spores (conidia) produced by the fungus are easily spread via air currents or rain splash. Wet or humid conditions, along with moderate to cool temperatures, are conducive to disease development.

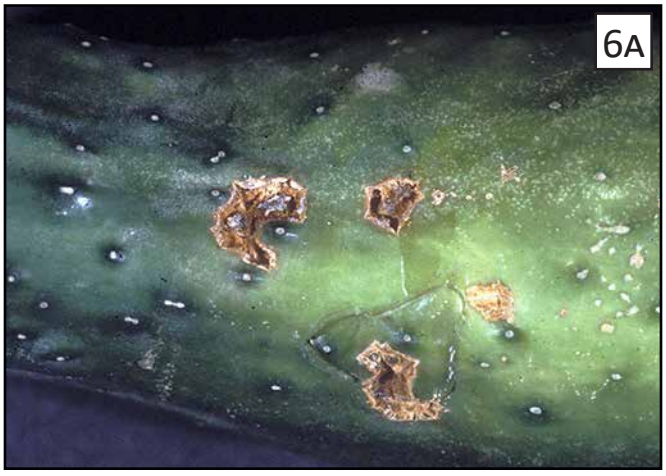

Figure 6. Scab causes small sunken spots on fruit (**A**); later, lesions become covered with olive green fungal growth (**B**).

Disease Management

Cultural practices

- Purchase pathogen-free seed.
- Plant resistant cultivars.
- Practice crop rotation using tolerant (or less susceptible) plants such as corn, sorghum, small grains, and grasses.
- Deep plow soon after harvest to bury crop debris and to allow for the complete decomposition of plant residues.
- Provide a physical barrier, such as black plastic mulch or dry, rolled straw, to minimize fruit contact with soil.
- Manage excess soil moisture by choosing well-drained sites or elevating plant beds.
- Adjust irrigation to avoid excessively wet soil. Avoid overhead irrigation, or irrigate in the morning to allow for rapid drying.
- Space plants for good air movement, which quickens drying of plant tissues.
- Remove infected plants and fruit whenever practical and discard far off-site.
- Handle fruit carefully during harvest to avoid wounding.
- Avoid storage of infected fruit.

Fungicides

- Start a fungicide program for cucurbits no later than vine touch. For current fungicide recommendations, refer to the production guides listed in Additional Resources, or contact a Kentucky county Extension office.
- Fungicides are not a practical management tool for Choanephora fruit rot because of the difficulty in protecting developing blossoms throughout the season.

Additional Resources

Production Guides

- Home Vegetable Gardening in Kentucky (ID-128)
http://www.ca.uky.edu/agc/pubs/id/id128/id128.pdf
- Southeast U.S. Vegetable Crop Handbook
https://www.aces.edu/blog/topics/vegetable-crops/southeastern-us-vegetable-crop-handbook/
- Vegetable Production Guide for Commercial Growers, ID-36
https://www2.ca.uky.edu/agcomm/pubs/id/id36/id36.pdf

IPM Scouting Guides

- IPM Scouting Guide for Common Problems of Cucurbit Crops in Kentucky (ID-91)
http://www.ca.uky.edu/agc/pubs/id/id91/id91.pdf
- IPM Scouting Guide for Common Problems of Vegetable Crops (mobile website)
https://veggiescout.ca.uky.edu/

Other Cucurbit Fruit Rots

- Phytophthora Blight of Cucurbits & Solanaceous Vegetables (PPFS-VG-04)
https://plantpathology.ca.uky.edu/files/ppfs-vg-04.pdf
- Southern Blight (PPFS-GEN-16)
https://plantpathology.ca.uky.edu/files/ppfs-gen-16.pdf

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Editor: Cheryl Kaiser, Plant Pathology Extension Support
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Revised from the fact sheet, *Fruit Diseases of Cucurbits* (PPFS-VG-07) by Emily Pfeufer