

ANTHRACNOSE OF CUCURBITS

Anthracnose, caused by the fungus *Colletotrichum orbiculare*, is a destructive disease of cucurbits in warm seasons with frequent rains. The disease occurs worldwide. Losses have been greatest on watermelon, muskmelon, cucumber, gourd, and to a lesser extent on pumpkin, West Indian gherkin, and chayote. Other susceptible cucurbits include citron, mock-cucumber, balsam-apple, balsam-pear, and numerous weeds belonging to the Cucurbitaceae family. Losses of 30 percent or more can occur on susceptible crops where control practices are not followed.

Symptoms

All aboveground plant parts may become infected. Leaves first show small, pale yellow or water-soaked areas that enlarge rapidly and turn to tan to dark brown (most cucurbits) (Figure 1) or irregular and black (watermelon) (Figure 2). The spots or lesions may merge blighting large areas of the leaves, and in severe cases whole leaves may die. Wind-blown commonly tears the dry, dead centers of the spots, leaving the foliage ragged. Tan to black lesions, which form on muskmelon and watermelon petioles and stems, become elongated and slightly sunken (Figure 3). Defoliation and killing of infected vines are common on muskmelon.



Figure 1. Leaf spots on a cucumber leaf, caused by the Anthracnose fungus.

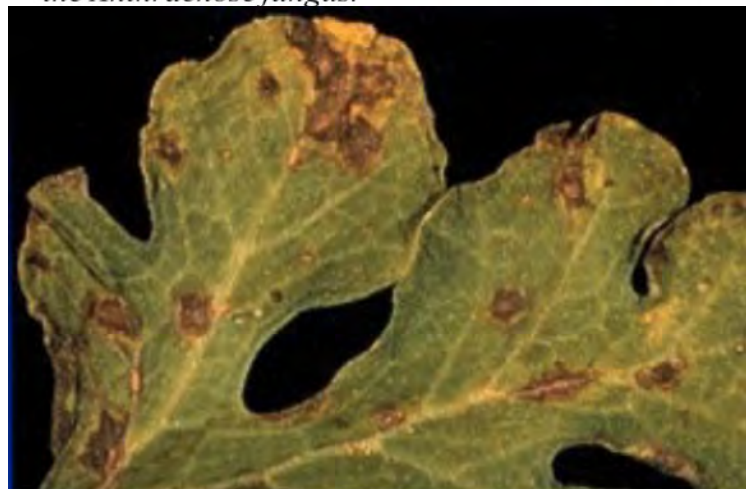


Figure 2. Close up of anthracnose lesions on a watermelon leaf (Purdue University photo).

The most noticeable symptoms appear on the fruit. The most characteristic symptoms are

For further information contact **Mohammad Babadoost**, Extension Specialist in Fruit and Vegetable Pathology, Department of Crop Sciences, University of Illinois, at Urbana-Champaign. (Phone: 217-333-1523; email: babadoos@illinois.edu).

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produced on the fruit, where circular, black, sunken cankers appear (Figures 4 and 5). Young fruits may turn black, shrivel, and die if fruit pedicels are infected. Circular, water-soaked spots develop on the older fruit. These lesions soon become sharply sunken and then pinkish in moist weather, gradually turning dark green to black with flesh-colored, oozing centers (Figures 5). The spots vary in size from ¼ inch to 2½ inches in diameter, depending on the kind of plant, age of the spot, extent of the lesions and their tendency to merge.

Severely infected fruit are unsightly, insipid, or bitter to the taste, and rot quickly when secondary soft-rot organisms invade the broken rind.

When the anthracnose fungus is seed-borne the cotyledons droop and wilt, and lesions may form on the stem near the soil line.

Disease Cycle

The *Colletotrichum* fungus overwinters in refuse from a previous vine crop or in weeds of the Cucurbitaceae family. It may be seed-borne and is also transmitted by cucumber beetles. Frequent rains accompanied by surface drainage water and temperatures around 75°F (24°C) favor the spread and buildup of the fungus. It may also be carried by workers. The fungus can penetrate leaves directly and does not require natural openings (e.g., stomates) or wounds. Initial infection requires a period of 100 percent relative humidity for 24 hours and a temperature of 68 to 75°F (20° to 24°C). Symptoms can appear within 6 days after infection has taken place. Spore-bearing structures (acervuli) break through the host surface (Figure 6) and produce tremendous numbers of one-celled, colorless spores (conidia) which exude from the acervuli in



Figure 3. Anthracnose lesions on watermelon stems.



Figure 4. Anthracnose lesions on a pumpkin fruit.



Figure 5. Anthracnose lesions on a muskmelon fruit (Purdue University photo).

moist weather. The pinkish masses of conidia are formed on new lesions and serve as inoculum for secondary disease cycles.

Most damage from anthracnose generally occurs late in the season after the fruits are well formed. Postharvest infections occur when fruit are wounded and washed with contaminated water. Several distinct races of the *Colletotrichum* fungus are known. Different kinds of host plants and crop cultivars may react differently to these races.

Disease Management

1. Plant only certified, pathogen-free seed.
2. Rotate with crops other than cucurbits for 3 years or longer. Plant in well-drained soil free from surface run-off water.
3. Avoid cultivating or handling plants when they are wet with dew or rain.
4. Control all weeds, especially wild and volunteer cucurbits.
5. Where feasible, collect and burn or plow down cleanly all infected plant debris after harvest.
6. Follow a rigorous, weekly spray program starting at the first true leaf stage. Several effective fungicides for control of cucurbit anthracnose are available. Thorough coverage of all plant parts must be accomplished if desired control is to be achieved. Try to spray plants just before rainy periods when infections occur. Follow the manufacturer's directions regarding amounts to use, the interval between the last spray and harvest, and compatibility between fungicides and insecticides.
7. To prevent post-harvest losses, avoid wounding (bruising, scratching, or puncturing) fruits. Immersing fruits in clean and fresh wash water containing 120 parts per million chlorine aids in preventing new infections but does not eradicate previous infections.
8. Where practical, grow watermelon and cucumber cultivars with resistance to common races of the anthracnose fungus.

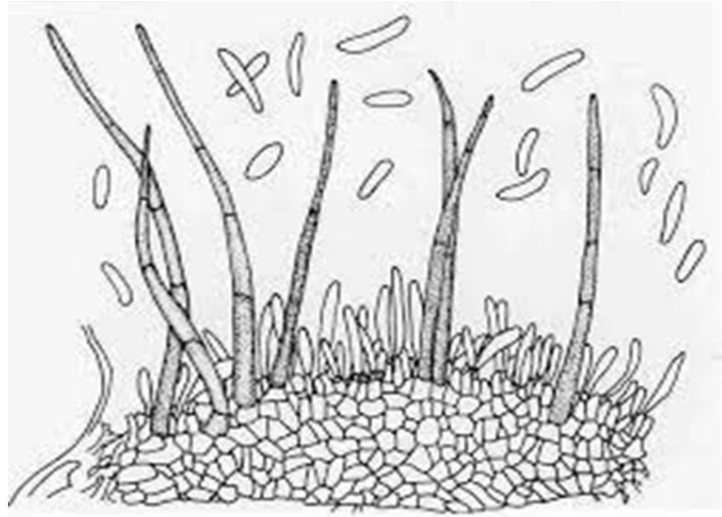


Figure 6. *Colletotrichum orbiculare*, the anthracnose fungus . Below, section of an acervulus showing short conidiophores, many bearing immature conidia, and tall dark bristles (setae); Above, one-celled colorless conidia. (Drawing by L. Gray).

Updated information concerning weed control, spray schedule, and disease control is available in the Midwest Vegetable Production Guide for Commercial Growers.