



A Series on Diseases in the Florida Vegetable Garden: Cantaloupe¹

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Disease-causing organisms in the Florida Vegetable Garden

Many Floridians delight in maintaining a vegetable garden in their backyard. Others keep several pots of popular vegetables on patios or similar residential sites. Our long growing season and generally mild climate are ideal for the gardening enthusiast. Furthermore, the health benefits of moderate gardening activity are well documented, and the supply of wholesome garden-fresh vegetables and fruits adds to our quality of life in the Sunshine State.

Sometimes pest problems interfere with our gardening pursuits. Some problems, such as weeds and certain insects, are relatively easy to identify as causing damage. However, another group of maladies, plant diseases, can cause serious damage and are underappreciated and not as well understood by many homeowners.

The majority of plant health problems categorized as plant diseases are caused by microorganisms. As the name implies, these are extremely tiny disease-causing agents that ordinarily require a microscope to be seen. The very minute size of these disease-causing pathogens accounts for the mystery that often surrounds their presence and impact in the garden.

The pathogenic microorganisms that attack garden vegetables, including cantaloupe, can be classified into three major groups: fungi, bacteria, and viruses.

Fungi

Fungi are seen (100-400x magnification) as threads (hyphae) that absorb food and water from their host (Fig. 1). Many of these fungi reproduce by forming thousands and thousands of spores that are readily blown about by even light winds. These spores can alight on your plants and eventually cause

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disease. Some fungi have the capacity to survive very long periods of time (10 or more years) in soil in the absence of a host. Once seeds are planted in infested soil, these "resting" fungal structures can become viable again and attack plant roots, causing disease. The majority of diseases you are likely to find in your home garden are caused by fungi.

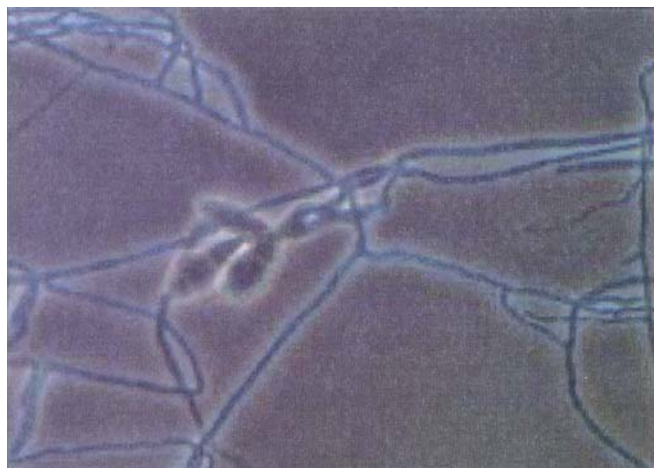


Figure 1. Microscopic threads (hyphae) and spores of a typical plant-pathogenic fungus.

Bacteria

Bacteria are even smaller than fungi (you need a 1000x magnification with a special light microscope to see them) (Fig. 2). They consist of only one cell and do not form the airborne spores that fungi do. Rather than being blown by the wind, bacteria are usually spread by splashing water, as in rainstorms or overhead sprinkler irrigation. They can also be spread by gardeners who touch diseased plants and healthy plants in succession without thoroughly washing their hands in-between.



Figure 2. A bacterial cell.

Viruses

Viruses are most strange indeed (Fig. 3). They are not "organisms" in the sense of the fungi and bacteria. They are very large molecular structures consisting of a nucleic acid (DNA or RNA) wrapped in a protective coating of protein. Once inside plant cells, they take over the host cellular machinery and use it to produce more viruses. Most of the important viruses are transmitted to garden plants by insects such as aphids, whiteflies, or thrips.



Figure 3. Typical rod shaped virus as seen through a powerful electron microscope.

Specific Common Cantaloupe Diseases

The following diseases are a few of the ones, in our experience, that are most likely to appear on your garden cantaloupe. This is not by any means an exhaustive list of cantaloupe diseases, but the ones we feel occur most often in Florida home gardens. If you have a problem that you think might be a disease not covered in this publication, search the EDIS database or that of the Department of Plant Pathology web site of IFAS University of Florida for information on additional cantaloupe diseases. Legal uses and effectiveness of plant disease control chemicals change with time. You are strongly advised to consult you local UF IFAS Cooperative Extension office for current disease management recommendations.

Alternaria Leaf Spot

Symptoms of Alternaria leaf spot are small circular spots which may have a dark-green margin, called water-soaking, and enlarge to 1/2 inch or more across. Concentric rings appear in the spots as they enlarge, giving a "target spot" appearance. Fruit is seldom attacked unless plants are nutrient deficient. The pathogen overseasons on infected plant debris and spores are wind-borne and rain-splash dispersed. If Alternaria leaf spot is a recurrent problem in your garden, you might have to apply broad-spectrum fungicide every 7-10 days in order to protect plants. Consult with the UF IFAS Cooperative Extension Service for recommended fungicides. See Plant Pathology Fact Sheet PP-32: "Alternaria Leaf Spot of Cucurbits".



Figure 4. Alternaria leafspot on cantaloupe leaves.

Angular Leaf Spot

Symptoms of angular leaf spot occur on the leaves, stems, and fruit. Spots on the leaves are irregular in shape, angular, and water-soaked (dark-green along margins of the spot). Free moisture allows the bacteria to ooze from the spots, which, upon drying, leave a white residue. The spots of dead tissue will occasionally drop away from the healthy tissue leaving irregular holes in the leaves. The bacterium is seedborne and rain-splash dispersed. This bacterial disease occurs during cool, damp weather. The best cultural control methods for angular leaf spot are to: a) use pathogen-free seed; b) rotate land and c) avoid handling plants when wet. Consult with the UF IFAS Cooperative Extension Service for recommended copper fungicides.



Figure 5. Angular leaf spot on young cantaloupe leaf.

Anthracnose

This disease has not been common in Florida. The disease symptoms first appear on the foliage as small, yellow, water spots that enlarge rapidly and turn brown. The dead tissue dries and may crack and fall out. On the stems, the lesions are elongated. On the fruits, dark, circular, sunken lesions appear, varying in size with the age. During wet weather the center of the spots often show a pinkish color due to production of spores. Cultural control methods for anthracnose include selecting resistant varieties, removing diseased plant residue and the practice of crop rotation. Consult with the UF IFAS Cooperative Extension Service for recommended fungicides.

Cercospora Leaf Spot

Leaf spots are small (ranging from 1/8"-1/4" in diameter), circular and often are surrounded by a slight yellow halo. The lesion centers typically develop a white color. Spores are air-borne and rain-splash dispersed. The *Cercospora* fungus overseasons on plant debris and weed hosts. Consult with the UF IFAS Cooperative Extension Service for recommended fungicides.

Damping-Off

This disease on seedling cantaloupes is caused by several soil-inhabiting fungi that are almost universal in occurrence. These fungi infect portions of the plant at or below the soil level, resulting in collapse and death of the seedling. Conditions unfavorable for rapid emergence of cantaloupes

(cool, wet weather) are usually most favorable for this disease. Plant in well-tilled soil where old crop and weed debris has been plowed down 30 days previously. Try to select a planting time when it is not too cool so that seeds can germinate quickly and emerge from soil and grow rapidly. See Plant Pathology Fact Sheets PP-1:"Rhizoctinia Seedling Blights of Vegetables and Agronomic Crops" and PP-53:"Diseases of Agronomic and Vegetable Crops caused by Pythium".

Downy Mildew

This disease first appears on the foliage as pale areas separated by islands of darker green tissue. These spots develop into an angular, yellowish lesion. Older lesions become brown and necrotic. Severely affected leaves may become chlorotic, brown and shrivel. During moist periods, a grayish spore mass may be observed on the lower leaf surface under these spots. Spores are dispersed by wind. It is virtually impossible to avoid this disease in south Florida. See Plant Pathology Fact Sheet PP-2. Prior to planting, choose a variety with resistance to this disease. Consult with the UF IFAS Cooperative Extension Service for recommended fungicides.



Figure 6. Symptoms of downy mildew.

Gummy Stem Blight

On young seedlings, Gummy stem blight symptoms appear as lesions on the cotyledons and true leaves that are round or irregular, brown, with faint concentric rings. Lesions in stems and fruit are brown, usually turn white with age and may ooze or bleed an amber plant fluid: hence the name "gummy"



Figure 7. Severe symptoms of downy mildew on cantaloupe in field.

stem blight. The causal fungus can often be observed to reproduce on the crowns or stem lesions and will produce small black specks (pycnidia) in the plant tissue. The fungus over-seasons on old plant debris and can be seedborne. The pathogen is spread by splashing rain from plant to plant, or can be carried long distances on wind currents. To control this disease, start with seeds or transplants that are disease-free. Avoid planting in the same location if youve had a problem with this disease on your cucurbits in previous seasons. Consult with the UF IFAS Cooperative Extension Service for recommended fungicides. See Plant Pathology Fact Sheet PP-27:"Gummy Stem Blight of Cucurbits".



Figure 8. Gummy stem blight lesion on cantaloupe vine.

Cultural Controls: Avoid planting in fields with residual cucurbit crop debris still present. Purchase disease-free transplants.



Figure 9. Gummy stem blight lesions (young and old) on honeydew melon fruit.

Powdery Mildew

Symptoms of powdery mildew can occur on the leaves and stems. Symptoms first appear as round whitish spots on the under side of the older leaves. The spots increase in number and size and merge together. These appear on the upper surface with a white powdery growth. Severely affected leaves lose their normal dark color, become pale yellow green, then brown, and shrivel. The young stems may also be killed. Fruits of infected vines ripen prematurely, are of poor quality and often become sunburn. Spores are readily wind-dispersed. As with the downy mildew, this disease is difficult to avoid in south Florida. Consult with the UF IFAS Cooperative Extension Service for recommended fungicides.

Viruses (*Cucumber mosaic virus*, *Papaya ringspot virus*, *Watermelon mosaic virus 2*, *Zucchini Yellow mosaic virus*)

The viruses listed above are the most common viruses in cantaloupe in Florida. Viruses symptoms typically appear on leaves show varying degrees of mottling, distortion and stunting. Growth habit may be altered as infected vine tips appear more erect. Fruits may occasionally be mottled and deformed. These viruses may also occur naturally on many weed hosts throughout the state and move into cantaloupes by aphid feeding. Try to eliminate weeds in and around plantings. This will aid in virus control. Treating gardens repeatedly with insecticides for aphid control is not recommended because of the short time period needed by aphids to transmit the virus while feeding.



Figure 10. Typical virus symptoms on cucurbit plant.

Some tips on disease prevention for cantaloupe:

- 1) Do not follow cucurbit crops (i.e., cucumber, cantaloupe, watermelon, and etc) with another cucurbit.
- 2) Destroy litter from previous plantings and bury deep in soil.
- 3) Treat soil for nematodes.
- 4) Buy treated seeds.
- 5) Do not over- or under-water plants and give adequate but not excessive fertilizer.
- 6) Examine plants frequently for appearance of plant disease symptoms and treat as quickly as possible.