

# 2017 Florida Plant Disease Management Guide: Cucumber<sup>1</sup>

Pamela D. Roberts<sup>2</sup>

## Specific Common Diseases

### Angular Leaf Spot (*Pseudomonas syringae* pv. *lachrymans*/*Pseudomonas syringae*)

**Symptoms:** Symptoms are found on the leaves, stems, and fruit. Spots on the leaves are typically angular and water-soaked. Free moisture allows the bacteria to ooze from the spots, which may, upon drying, leave a white residue. These spots of dead tissue will occasionally drop away from the healthy tissue leaving irregular ‘shotholes’ in the leaves.

The spots on the fruit are generally smaller, nearly circular and slightly depressed. Early external fruit infections may be so small as to be impossible to cull out during packing. Internal symptoms, however, are quite obvious. The internal flesh discolors (brown) from below the skin lesion down to the seed layer within the fruit and may run the entire length of the fruit. Older fruit lesions turn white with an obvious tissue cracking. This disease is apt to be severe during wet springs and is rain-splash dispersed. The causal bacterium can survive in infected crop debris. The bacterium is seedborne.

**Cultural Controls:** Use disease-free seed and rotate crops to avoid this pathogen surviving in residual crop debris. Avoid

working or harvesting fields while foliage is wet. Mechanical spread of the bacterial pathogen is likely. Rotate crops with non-hosts.

**Chemical Controls:** See Chapter 6 of the 2016–2017 *Vegetable Production Handbook of Florida*, “Cucurbit Production” (<http://edis.ifas.ufl.edu/cv123>).

### Anthracnose (*Colletotrichum lagenarium*)

**Symptoms:** Symptoms of the disease first appear on the foliage as small, yellow or reddish-brown, water-soaked spots often on veins, which enlarge rapidly and turn brown. The dead tissue dries and may crack and fall out. On the stems, the lesions are elongated and light brown to black in color. In fruit, circular, water-soaked, sunken lesions appear, varying in size with the age. Lesions turn dark green to brown. During wet weather, the centers of the spots often show a pinkish color due to production of spores of the causal fungus.

This disease is particularly severe during wet seasons where temperatures remain between 70 and 80° F. The fungus can survive in old crop debris and on weed hosts. This fungus is known to infect balsam pear (*Momordica* sp.), bottle-gourd (*Lagenaria* sp.), cantaloupe, chayote (*Sechium* sp.), mock

1. This document is PDMG-V3-38, one of a series of the Department of Plant Pathology, 2017 Florida Plant Disease Management Guide, UF/IFAS Extension. Reviewed June 2009. Please visit the EDIS website at <http://edis.ifas.ufl.edu>. Originally published as *2009 Florida Plant Disease Management Guide: Cucumber* by Pamela Roberts and Tom Kucharek (<http://ufdc.ufl.edu/IR00006730/00001>).

2. Pamela D. Roberts, professor, Plant Pathology Department, Southwest Florida Research and Education Center, Immokalee, FL.

The use of trade names in this publication is solely for the purpose of providing specific information. UF/IFAS does not guarantee or warranty the products named, and references to them in this publication does not signify our approval to the exclusion of other products of suitable composition.

The Institute of Food and Agricultural Sciences (IFAS) is an Equal Opportunity Institution authorized to provide research, educational information and other services only to individuals and institutions that function with non-discrimination with respect to race, creed, color, religion, age, disability, sex, sexual orientation, marital status, national origin, political opinions or affiliations. For more information on obtaining other UF/IFAS Extension publications, contact your county’s UF/IFAS Extension office. U.S. Department of Agriculture, UF/IFAS Extension Service, University of Florida, IFAS, Florida A & M University Cooperative Extension Program, and Boards of County Commissioners Cooperating. Nick T. Place, dean for UF/IFAS Extension.

cucumber (*Echinocystis* sp.), and watermelon. See *Cucumber Antracnose in Florida* (<http://edis.ifas.ufl.edu/pp266>).

**Cultural Controls:** Choose resistant varieties. Avoid working fields when plant foliage is wet. Deep plow plant residue and practice crop rotation. Use disease-free seed.

**Chemical Controls:** See Chapter 6 of the 2016–2017 *Vegetable Production Handbook of Florida*, “Cucurbit Production” (<http://edis.ifas.ufl.edu/cv123>).

### Belly Rot (*Rhizoctonia solani*)

**Symptoms:** This disease is caused by a common soilborne fungus which infects the ground (belly) side of fruit. Young cucumbers exhibit a yellow reddish-brown, superficial discoloration which develops into a sunken, irregular lesion or pit in the fruit underside. Mature fruits develop a large, water-soaked decay. This disease proceeds rapidly above 82° F and in periods of high humidity, a dense, light brown mold growth develops from the lesions on the fruit.

**Cultural Controls:** Incorporate the previous crop or weed debris at least 4–6 weeks prior to planting. The use of full bed plastic mulch will greatly reduce disease incidence where fruit is produced on the plastic.

**Chemical Controls:** See Chapter 6 of the 2016–2017 *Vegetable Production Handbook of Florida*, “Cucurbit Production” (<http://edis.ifas.ufl.edu/cv123>).

### Cottony Leak (*Pythium* spp.)

**Symptoms:** This disease is primarily a fruit rot but the causal fungal-like organism can cause a damping-off of seedlings or produce vine cankers during unusually wet growing seasons. In the field, the pathogen can enter the fruit through old floral parts or directly from the soil. The fungus produces dark green, water-soaked lesions. The fruit become soft and mushy very rapidly and may be completely covered with white, cottony mycelium during warm, wet weather. Fruit rot can occur rapidly in transit when conditions are moist since the fungus spreads by fruit-to-fruit contact.

**Cultural Controls:** Plant only in well-drained fields. Avoid picking fruits from infested areas of the field. Infected fruits will contaminate adjacent fruits in buckets or hampers or other picking containers.

**Chemical Controls:** See Chapter 6 of the 2016–2017 *Vegetable Production Handbook of Florida*, “Cucurbit Production” (<http://edis.ifas.ufl.edu/cv123>).

### Damping-off (*Pythium* spp., *Fusarium* sp., *Rhizoctonia solani*)

**Symptoms:** Seed fails to germinate due to rapid colonization of seed by soilborne fungi and fungal-like organisms. Excavated seed will be rotted and soft, often with evidence of fungal mycelium. Young, newly emerged seedlings often collapse at soil line and topple over. The stems may exhibit an obvious discoloration ranging in color from a reddish-brown to black and may be dry or mushy to the touch depending on the soil fungus involved.

**Cultural Controls:** Avoid planting seed when soil moisture, soil preparation, temperature or planting depth do not favor rapid emergence. Plant in well tilled soil where old crop and weed residue has been plowed down 30 days previously. Plant fungicide-treated seeds.

**Chemical Controls:** See Chapter 6 of the 2016–2017 *Vegetable Production Handbook of Florida*, “Cucurbit Production” (<http://edis.ifas.ufl.edu/cv123>).

### Downy Mildew (*Pseudoperonospora cubensis*)

**Symptoms:** The disease first shows as angular, yellow spots on the upper leaf surface. If the weather is humid and warm, a gray mold growth is evident on the under surface. As the spots enlarge, a general leaf yellowing develops followed by browning and death of leaf tissue. Usually the first symptoms are on older leaves and they gradually move outward. Periods of wet weather, heavy dews or fog are favorable for severe disease occurrence. Spores are dispersed by the wind. See *Management of Cucurbit Downy Mildew in Florida* (<http://edis.ifas.ufl.edu/pp325>).

**Cultural Controls:** Choose downy mildew-resistant varieties, although recent outbreaks may indicate that resistance alone will not control this disease. Avoid working fields when plant foliage is wet. Maintain a preventative fungicide control program during wet, humid weather.

**Chemical Controls:** See Chapter 6 of the 2016–2017 *Vegetable Production Handbook of Florida*, “Cucurbit Production” (<http://edis.ifas.ufl.edu/cv123>).

### Fusarium Wilt (*Fusarium oxysporum* f. sp. *cucumerinum*)

**Symptoms:** The causal fungus is soilborne and may infect the cucumber at any stage of growth. Freshly seeded cucumbers may damp-off below ground or as newly emerged seedlings. If older plants are infected prior to vine

elongation, the entire plant will exhibit a mid-day wilt. After several days of wilting, leaves will tip burn followed closely by a complete wilt and plant death. Plants infected in the vining stage of growth will often wilt in only one or two runners.

Diagnostic field symptoms are the wilting syndrome and the brown discoloration of the vascular tissue within the lower stem when split open. In moist weather, the whitish-pink fungal mycelium may be observed on the outside of the lower stems.

**Cultural Controls:** Rotate with other crops such as crucifers, legumes or solanaceous plants. Occurrence of this disease in commercial greenhouses should be controlled through sanitation of infected plants and soil fumigation. Raising the soil pH reduces this disease.

### **Gummy Stem Blight (*Didymella bryoniae*)**

**Symptoms:** Lesions in the cotyledons and leaves are round or irregular, brown and with a faint zonation. Lesions in the crown and stems are brown, usually turn white with age and often exhibit a sap flow. The disease will usually begin at the crown and progress outward on the vines.

The causal fungus is seedborne and can survive on crop and weed host debris. Secondary spread is by rain-splashed spores. The fungal pathogen is known to infect cantaloupe, chayote, pumpkin, squash and watermelon. The black, speck-like fruiting structures (pycnidia) can often be found in lesions. See Management of Gummy Stem Blight (Black Rot) in Cucurbits in Florida (<http://edis.ifas.ufl.edu/pp280>).

**Cultural Controls:** Use resistant varieties. Use fungicide-treated seed and initiate a fungicide spray program at first disease appearance. Avoid planting in fields with residual crop debris. Use healthy transplants.

**Chemical Controls:** See Chapter 6 of the 2016–2017 *Vegetable Production Handbook of Florida*, “Cucurbit Production” (<http://edis.ifas.ufl.edu/cv123>).

### **Powdery Mildew (*Podosphaera xanthii*)**

**Symptoms:** The fungus infects leaves and stems. Round, whitish spots on the underside of the older leaves appear. The spots increase in size, coalesce, appear on the upper surface with a white powdery growth. Severely affected leaves lose their normal dark-green color and become pale yellow-green, then brown and shriveled. The young stems may also be killed. Fruits may sunscald as a result of loss

of foliage. Spores are readily wind-dispersed over long distances.

**Cultural Controls:** Plant resistant varieties. Excellent resistance is available.

**Chemical Controls:** See Chapter 6 of the 2016–2017 *Vegetable Production Handbook of Florida*, “Cucurbit Production” (<http://edis.ifas.ufl.edu/cv123>).

### **Scab (*Cladosporium cucumerinum*)**

**Symptoms:** On the leaves, the fungus produces small brown spots with yellow margins. The brown center may fall out leaving a ragged hole. Young leaves at the vine tips may become distorted. The greatest damage is to the fruit. Here small sunken dark gray spots appear, and a sticky material oozes from the spots. As the spots enlarge, they often run together forming large scab-like diseased areas. In humid periods, spores are produced giving the spots an olive-green color.

This disease is most severe in cool weather. The causal fungus can be seedborne or survive on old cucumber crop debris. Spores can be carried by air currents or spread by water splashing, clothing, or tools.

**Cultural Controls:** Exercise crop rotation for at least three years where this disease is a problem. Plant resistant varieties and achieve additional control through the use of fungicides.

**Chemical Controls:** See Chapter 6 of the 2016–2017 *Vegetable Production Handbook of Florida*, “Cucurbit Production” (<http://edis.ifas.ufl.edu/cv123>).

### **Target Spot (*Corynespora cassiicola*)**

**Symptoms:** Symptoms often look the same as downy mildew. Target spot begins on leaves as yellow to white leaf flecks, becoming angular with a definite outline. Later, the spots become circular with light brown centers surrounded by dark-brown margins.

Individual lesions are 1/8 to 3/8 inch in diameter. Lesions coalesce and produce larger dead areas with drying and shredding of leaves. Fungus survives on infested plant material and conidia are readily airborne dispersed

**Cultural Controls:** Avoid working infested fields when they are wet. Remove and destroy infected plant debris. Apply fungicides as needed to control this disease.

**Chemical Controls:** See Chapter 6 of the 2016–2017 *Vegetable Production Handbook of Florida*, “Cucurbit Production” (<http://edis.ifas.ufl.edu/cv123>).

## **Aphid-Transmitted Mosaic Viruses (Papaya Ringspot Virus Type W, Cucumber mosaic virus, Zucchini yellow mosaic virus, Watermelon mosaic virus 2)**

**Symptoms:** Leaves show varying degrees of mosaic, distortion, and stunting. Fruits may also be mottled and deformed. These viruses are aphid-transmitted and can infect cantaloupe, squash, watermelon and a number of common weeds including balsam pear (*Momordica* sp.), bur cucumber (*Sicyos* sp.), citron (*Citrullus vulgaris* var. *citroides*), creeping cucumber (*Melothria* sp.) plantain (*Plantago major*), *Sesbania* sp., showy croton (*Crotalaria spectabilis*), sweet clover (*Melilotus indicus*), alyceclover (*Alysicarpus* sp.) and many other plant species.

**Cultural Controls:** Maintain weed control in and around cucumber plantings. Insecticide control of the aphid vector is not recommended because of the rapid transmission of the virus during aphid feeding.

**Chemical Controls:** See Chapter 6 of the 2016–2017 *Vegetable Production Handbook of Florida*, “Cucurbit Production” (<http://edis.ifas.ufl.edu/cv123>) for use of JMS Stylet Oil. For management of the aphid vector, see *Insect Management for Cucurbits (Cucumber, Squash, Cantaloupe, and Watermelon)* (<http://edis.ifas.ufl.edu/in168>).