College of Agriculture, Food and Environment
Cooperative Extension Service

Plant Pathology Fact Sheet **PPFS-VG-10**

Leaf Spot Diseases of Cucurbits:
Alternaria Leaf Blight, Angular Leaf Spot & Anthracnose

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Introduction

Leaf spot diseases indirectly result in yield losses in cucurbits by reducing photosynthetic surfaces, which in turn, negatively impact size, quality, and quantity of fruit. In addition, premature defoliation exposes fruit to sunscald, followed by secondary fruit decay. In severe cases, foliar diseases can cause plant death.

Vegetable crops in the cucurbit family include cucumber, gourds, muskmelon (cantaloupe), summer squash, winter squash, and pumpkin. These cucurbit vegetables are susceptible to diseases of which Alternaria leaf blight, angular leaf spot, and anthracnose are the most common. Each disease, however, has a preferred host range within the cucurbit family. Cucurbit leaf spot diseases can develop in commercial fields, high tunnels, greenhouses, and residential gardens.

Alternaria Leaf Blight

Hosts

Alternaria leaf blight primarily affects watermelon and muskmelon (cantaloupe), but it may also occur on cucumber, gourds, pumpkin, and squash.

Symptoms

Disease symptoms first appear on older leaves as small, water-soaked spots. Enlarging spots become light to dark brown and may be surrounded by a yellow halo (Figure 1). A concentric ring pattern may be evident in older, large spots (Figure 2). Expanding lesions merge (coalesce) to form large, blighted areas (Figure 1). As symptoms progress, leaves curl, die, and drop prematurely, which leaves vines partially to completely defoliated. Affected fruit decays, often starting at the blossom end.

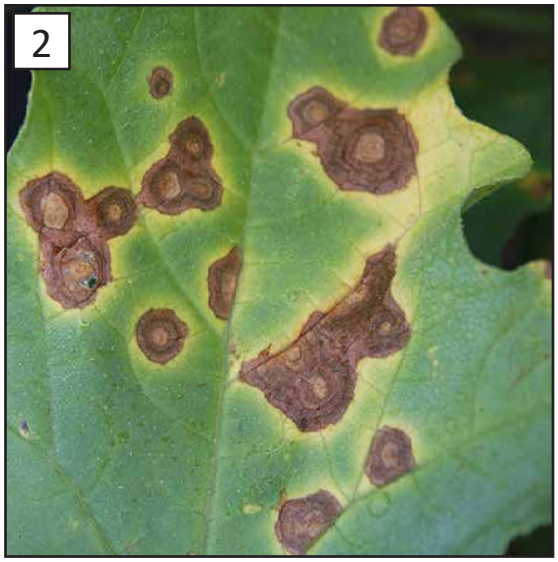


Figure 1. Alternaria leaf blight on muskmelon appears as brown spots with yellow halos. Large blighted areas may result when spots enlarge and coalesce. **Figure 2**. Spots often have distinct concentric ring patterns.
[Photos: Gerald Holmes, Strawberry Center, Cal Poly San Luis Obispo. Bugwood.org]

Cause & Disease Development

Alternaria leaf blight is caused by the fungus *Alternaria cucumerina,* which can survive 1 to 2 years as a saprophyte on decaying crop debris in the soil. It is spread from plant to plant when spores (conidia) are carried by wind and splashing water, moving from diseased plants to susceptible tissues.

Germinating spores can penetrate the host directly, as well as enter through wounds and natural openings. Wet conditions (frequent rains or overhead irrigation, relative humidity greater than 70%) and warm temperatures (68°F to 90°F) are optimal for infection and disease development.

Angular Leaf Spot

Hosts

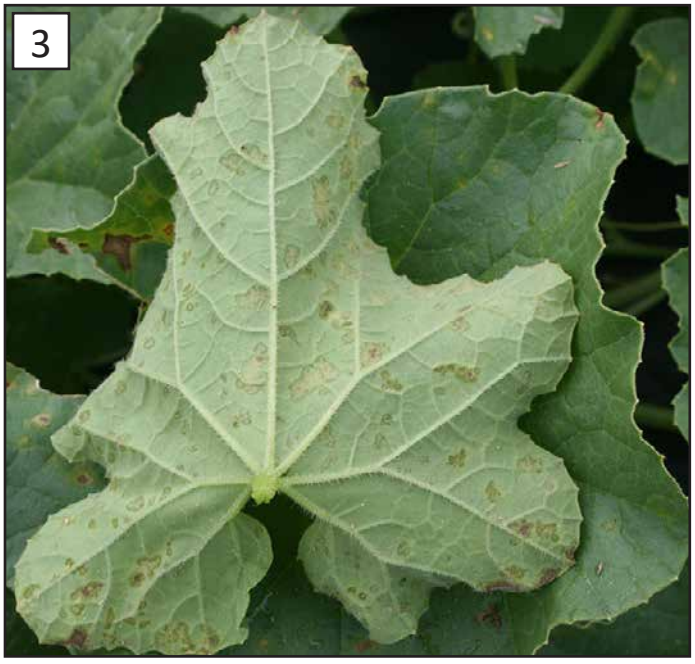
Angular leaf spot primarily affects cucumber and is less frequently reported on muskmelon, squash, pumpkin, and watermelon.

Symptoms & Signs

Foliar symptoms begin as small, water-soaked spots (lesions) that later enlarge (Figure 3). As enlarging spots encounter leaf veins, they become angular in shape (Figure 4). A yellow halo may develop on some hosts. Under warm and humid conditions, bacterial cells ooze from lesions, forming a white exudate on the undersurface of leaves. Stems and fruit may develop water-soaked spots and necrosis.

Cause & Disease Development

Angular leaf spot is caused by the bacterium *Pseudomonas syringae* pv. *lachrymans,* which overwinters in seed and on diseased plant material left in the field. The pathogen is disseminated by infected seed, splashing rain (and irrigation water), wind-blown rain, wind-blown soil, insects, farm equipment, and field workers. Infection occurs through natural openings and wounds. Wet conditions (frequent rains or overhead irrigation, relative humidity greater than 85%) and warm temperatures (75°F to 90°F) are optimal for infection and disease development.



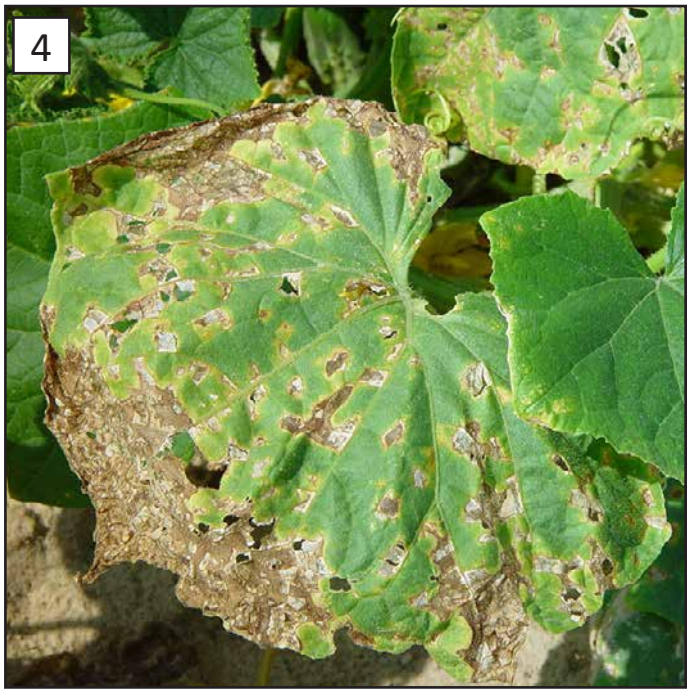


Figure 3. Angular leaf spots begin as water-soaked lesions on the underside of leaves. **Figure 4.** Spots take on the angular shape when their spread reaches leaf veins.
[Photos Gerald Holmes, Strawberry Center, Cal Poly San Luis Obispo. Bugwood.org (3) and Kenny Seebold, UK (4)]

Anthracnose

Hosts

Anthracnose is primarily a disease of cucumber, muskmelon, gourds, and watermelon; it is less frequently found on squash and pumpkin.

Symptoms & Signs

All above-ground plant parts are susceptible. On leaves, symptoms begin as small, circular lesions, later becoming large tan-to-brown spots (Figure 5). As spots coalesce, they create extensive blighting. The centers of older lesions may crack or fall out entirely (Figure 6). Leaf lesions tend to be smaller, irregularly-shaped, and darker in color on watermelon. Under humid conditions, lesions will blacken and salmon-pink masses of spores may be seen.

On stems, lesions are tan-to-brown, somewhat elongated, and sunken.

On maturing fruit, lesions appear as small, circular, sunken areas, which may grow to the size of a quarter or larger on melons. Fruit lesions on watermelon can be cracked and irregularly shaped. Losses in storage or shipment occur when fruit is infected in the field, but harvested before symptoms are evident.

Cause & Disease Development

Anthracnose is caused by the fungus *Colletotrichum orbiculare*, which often survives between crops in residue and cucurbit seed. Spores (conidia) released in spring infect susceptible tissues during wet, warm weather. Temperatures of 68°F to 75°F and wet or humid conditions (relative humidity greater than 70%) are optimal for infection. Spores are spread from plant to plant by splashing water, cultivating equipment, field workers, and insect activity.

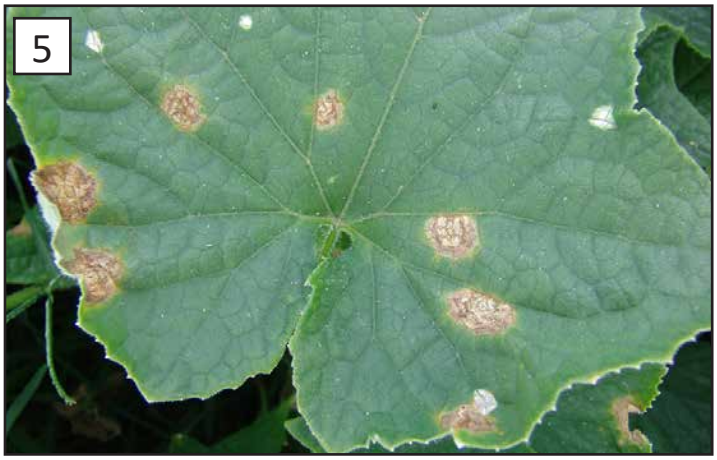


Figure 5. Anthracnose spots begin as circular lesions that are light brown-to-tan. **Figure 6.** Spots become irregular and centers crack or fall out.
[Photos: Gerald Holmes, Strawberry Center, Cal Poly San Luis Obispo. Bugwood.org]

Cercospora Leaf Spot

Hosts

Cercospora leaf spot affects cucumber, muskmelon (cantaloupe), and watermelon; squash may also become infected.

Symptoms & Signs

Disease primarily develops on leaves, but symptoms can also occur on stems and vines when conditions are favorable; fruit are not affected. Initially, small angular specks appear on foliage, expanding to roughly circular, light tan to brown spots (Figure 7). Lesions may have a darker border and/or yellow halo. As spots enlarge and coalesce, leaves yellow, die, and drop.

Figure 7. Cercospora leaf spots initially appear as small, angular lesions. [Photo: Dr. Parthasarathy Seethapathy, Amrita School of Agricultural Sciences, Bugwood.org]

Cause & Disease Development

Cercospora leaf spot is caused by the fungus *Cercospora citrullina*, which overwinters in crop debris and weeds. Spores (conidia) can be spread by wind, rain splash, and irrigation water; transmission via human activity, tools, and equipment is also possible. Warm temperatures (78°F to 90°F) and moist conditions are optimal for infection.

Disease Management

- Rotate out of cucurbits for at least 3 years.
- Select resistant cultivars, when available; cultivar resistance information is available in seed catalogs.
- Purchase and plant only certified pathogen-free seed.
- Disinfect cucumber seed in hot water (angular leaf spot). See *Vegetable Production Guide for Commercial Growers* (ID-36), Appendix I.
- Till crop debris after harvest and again before planting.
- Avoid overhead irrigation, especially late in the day.
- Do not work in plantings when foliage is wet (angular leaf spot).
- Provide good air circulation. Space plants for air movement; provide ventilation in greenhouse and high tunnel production.
- Apply fixed copper (angular leaf spot) and/or fungicides (Alternaria leaf blight and anthracnose) labeled for the targeted disease(s). Refer to Additional Resources for publications listing recommended fungicides or contact a local Extension office.
- Follow good sanitation practices, such as cleaning up crop debris at the end of the growing season.

Other Leaf Diseases

Although not leaf spots, downy mildew and powdery mildew can cause lesions that sometimes appear as spots or blotches. Downy mildew (Figure 7a) is caused by *Pseudoperonospora cubensis*, a fungus-like organism (water mold), and powdery mildew (Figure 7b) is caused by *Podosphaera xanthii*, a fungus. Separate publications are available for both of these important diseases (see Additional Resources).

Figure 7. Downy mildew **(A)** and powdery mildew **(B).**
[Photos: Kenny Seebold, Univesity of Kentucky]

Additional Resources

Cucurbit Leaf Spots

- Home Vegetable Gardening in Kentucky, ID-128
https://publications.ca.uky.edu/sites/publications.ca.uky.edu/files/ID128.pdf

- IPM Scouting Guide for Common Problems of Cucurbit Crops in Kentucky
https://publications.ca.uky.edu/sites/publications.ca.uky.edu/files/id91.pdf

- Vegetable Production Guide for Commercial Growers, ID-36
https://publications.ca.uky.edu/files/ID36.pdf

- Disease-resistant Cucurbit Varieties (Cornell University)
https://www.vegetables.cornell.edu/pest-management/disease-factsheets/disease-resistant-vegetable-varieties/disease-resistant-cucurbit-varieties/

- Southeastern U.S. Vegetable Crop Handbook
https://content.ces.ncsu.edu/southeastern-us-vegetable-crop-handbook

Other Cucurbit Foliar Diseases

- Cucurbit Downy Mildew in Kentucky (PPFS-VG-27)
https://plantpathology.ca.uky.edu/files/ppfs-vg-27.pdf

- Powdery Mildew (PPFS-GEN-02)
https://plantpathology.ca.uky.edu/files/PPFS-GEN-02.pdf

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