

LOUISIANA PLANT PATHOLOGY

DISEASE IDENTIFICATION AND MANAGEMENT SERIES

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Foliar Diseases of Watermelon

Although a variety of foliar diseases can occur on watermelon (*Citrullus lanatus* [Thunb.] Matsum. & Nakai), this article is meant to aid in distinguishing among the three primary foliar diseases observed on watermelons in Louisiana: anthracnose (caused by *Colletotrichum orbiculare*), gummy stem blight (caused by *Didymella bryoniae*) and downy mildew (caused by *Pseudoperonospora cubensis*). All three diseases can be quite destructive given the proper environmental conditions, but downy mildew has the greatest potential for causing widespread epidemics and losses. Both anthracnose and gummy stem blight can occur on fruit making them unmarketable, whereas downy mildew rarely occurs on the fruit. The disease, however, can reduce yields substantially by destroying the leaf canopy, thereby reducing plant growth and exposing the fruit to sunburn.

Anthracnose and gummy stem blight can occur on leaves, petioles, stems and fruit, whereas downy mildew occurs primarily on leaves. Anthracnose lesions on leaves tend to be brown to black with irregular margins often restricted by leaf veins (Fig. 1). Lesions on petioles are tan with an elongated, sunken appearance (Fig. 2). Pink spore masses also may be observed in the lesions. Gummy stem blight lesions on leaves tend to be tan to brown with a more circular appearance (Fig. 3). They also can appear water-soaked or greasy and often develop from the leaf margins inwards. Stem cankers usually have a brown, gummy exudate associated with them. Tiny black structures (pycnidia) are often visible within the lesions. Downy mildew is first visible on leaves as small, irregular chlorotic areas on the upper leaf surface (Fig. 4). As these lesions expand the tissues become necrotic and brown. This necrosis becomes quite extensive, and the affected leaf tissue may become dry and brittle. Infected leaves have a tendency to curl upward from the margins (Fig. 5). A downy, gray to purple growth also may be visible on the underside of the lesions.

All three diseases can develop quite rapidly when environmental conditions are suitable. All three are favored by warm, humid conditions and require the presence of moisture on the leaves for infection to occur. Anthracnose and gummy stem blight, however, generally require periods of rainfall for spore dispersal, but downy mildew does not because the sporangia are readily dispersed simply by air movement. Since *P. cubensis* is an obligate parasite and survives only within living cucurbits, disease develops only after the pathogen has been introduced into the



Fig. 1. Anthracnose on watermelon.



Fig. 2. Anthracnose lesions on watermelon petiole.



Fig. 3. Gummy stem blight on watermelon.

area either as windborne sporangia or within infected transplants. In contrast, both *C. orbiculare* and *D. bryoniae* can survive in the field in debris from previously infected plants, or they can be introduced on contaminated seed.

Disease management for all three diseases relies primarily on the use of fungicides. Fungicides are most effective when they are applied prior to the onset of disease, and they must be applied repeatedly as long as environmental conditions are suitable for disease development. Because these diseases can develop quite

rapidly, it is important to monitor fields on a regular basis to detect disease when it first appears and is still manageable. Since two of these pathogens (*P. cubensis* and *D. bryoniae*) can develop resistance to fungicides quite readily, it is important to follow label instructions to prevent the development of fungicide resistance. For information on fungicides for managing these diseases, see the Louisiana Plant Disease Management Guide or visit our Web site at www.lsuagcenter.lsu.edu.



Fig. 4. Downy mildew on watermelon.

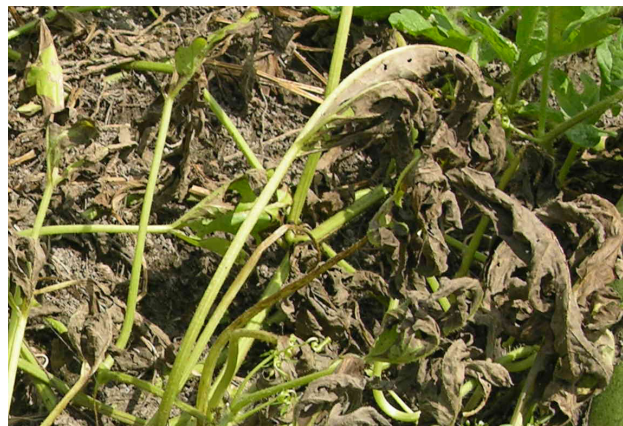


Fig. 5. Curling of watermelon leaves from downy mildew.

Distinctions among three common foliar diseases of watermelon.			
Disease	Symptoms	Spread	Management
Anthracnose (<i>Colletotrichum orbiculare</i>)	Leaves: brown to black lesions with irregular margins often restricted by leaf veins. Stems and petioles: shallow, elongated, tan lesions. Fruit: sunken, circular, water-soaked lesions that become black. <i>Pink spore masses may be visible within the lesions.</i>	Survives on infested plant residues; may be introduced on seed; spreads by rain-splashing, wind and mechanically on equipment, etc.	Deep plowing to bury plant residues after harvest; 1-yr rotation out of cucurbits; fungicides (low potential for resistance to develop).
Gummy stem blight (<i>Didymella bryoniae</i> = <i>Phoma cucurbitacearum</i>)	Leaves: circular, tan to brown lesions that may appear greasy or water-soaked and often develop inward from the margins; entire leaf may become blighted. Stems: cankers with a brown, gummy-appearing exudate. Fruit: water-soaked lesions. <i>Tiny, round black structures (pycnidia) may be visible within the lesions.</i>	Survives on infested plant residues; may be introduced on seed; spreads by rain-splashing and wind.	2- to 3-yr rotation out of cucurbits; use treated seed; fungicides (high potential for resistance to develop).
Downy mildew (<i>Pseudoperonospora cubensis</i>)	Leaves: small, irregular, chlorotic spots on upper leaf surface becoming brown and necrotic; entire leaf may become blighted; infected leaves tend to curl upward from the margins. <i>Gray to purple downy growth may be visible on underside of lesions.</i>	Survives only on living cucurbits; introduced into area by wind; spreads by air movement, rain-splashing and mechanically on equipment, etc.	Reduce canopy density; fungicides (high potential for resistance to develop).

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