

## 2006 Florida Plant Disease Management Guide: Watermelon<sup>1</sup>

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### Specific Common Diseases

#### Alternaria Leaf Spot (*Alternaria cucumerina*)

**Symptoms:** The causal fungus infects the leaves only. Lesions are usually round to irregular, dark brown or black, and frequently occur with concentric rings. Lesions of *Alternaria* leaf spot can often be confused with young gummy stem blight leaf spots because of the zonate appearance. The pathogen over-seasons on old diseased plant debris. Spores are readily dispersed by wind and rain. Spores can be found in association with seed. See Plant Pathology Fact Sheet PP-32.

**Chemical control.** See PPP-6.

#### Anthraxnose (*Colletotrichum orbiculare*)

**Symptoms:** This fungus infects leaves, stems, and fruits. It is seedborne and the disease may first appear as a brown spot on seedling cotyledons. Leaf lesions are angular or irregular, dark brown to black, and usually with a narrow yellow border. Many lesions characteristically develop on a single leaf thus originating the term “measles” for this disease.

Lesions on the stems are usually deep and elongate while those on the fruit are raised with sunken centers. The pathogen is spread from plant to plant in wind-driven rain and are carried by people and machinery moving through the vines when they are wet.

**Cultural Controls:** Plant only anthracnose-resistant watermelon varieties. Deep plow plant residue and practice crop rotation.

**Chemical Controls:** See PPP-6.

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

**Symptoms:** The bacterium affects both leaves and fruit. On the leaves, lesions begin as small water-soaked circular black spots surrounded by a yellow halo. The center of the spots may become white. As they enlarge, lesions become angular in shape and may involve an entire lobe of even larger portions of the leaf. This is a cool-weather pathogen. The pathogen is seedborne and seedlings may exhibit watersoaked lesions on the cotyledon while still in the transplant house.

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On fruits, lesions begin as small circular water-soaked areas a few millimeters in diameter and enlarge with age to cover larger portions of the melon surface. Lesions do not penetrate deeply into the fruit. On large lesions the cuticle ruptures and peels free from the melon surface. Bacterial ooze may be present.

**Cultural Controls:** Use disease-free seed.

**Chemical Controls:** See PPP-6.

### **Bacterial Fruit Blotch (*Acidovorax avenae* subsp. *citrulli*)**

**Symptoms:** Watermelon fruit develops a dark water-soaked lesion on the top or sides of watermelon fruit approximately 2 weeks before maturity or later. As these lesions expand, they crack and develop a brown, scaly appearance. Additional fruit breakdown occurs. The bacterium causes small, angular or linear necrotic lesions on true leaves. These lesions are small and similar to those caused by downy mildew or gummy stem blight. No significant leaf loss occurs. Lesions in seed leaves become necrotic, but they typically are water-soaked areas on the underneath side first. The pathogen is seedborne. Spread within a field is by windsplashed rain, workers, or equipment. Wet conditions are favorable for disease development.

**Cultural Controls:** Use pathogen-free, indexed seed and healthy transplants.

**Chemical Controls:** See PPP-6.

### **Blossom-end Rot (Calcium Deficiency)**

**Symptoms:** The blossom end of the fruit turns pale green to brown to black. These affected areas enlarge into sunken spots. The discolored fruit portion will shrivel into a dry rot unless the tissue is invaded by secondary organisms which often extend the area of rot throughout the fruit.

This condition can result from a number of situations that limit available calcium to the plant. Poorly limed soils may suffer from a deficiency of calcium in the soil. Calcareous soils seldom have this problem. Dry soil can limit calcium availability to roots regardless of the amount of calcium present in

the soil. Fluctuations in between wet and dry soil conditions, even for short time periods, can result in deficiency symptoms.

**Cultural Controls:** Follow a program of soil testing and lime according to the soil test results. Supplement erratic rainfall with irrigation during fruit development to avoid blossom-end root development. Foliar application of calcium may help existing blossom-end rot problems.

### **Cercospora Leaf Spot (*Cercospora citrullina*)**

**Symptoms:** The fungus only causes symptoms on the leaves. Lesions are usually round, small, dark brown to black, with white centers, and encircled with a yellow halo that extends several millimeters wide. The pathogen over-seasons on old debris. Spores are readily wind-borne and rain splashed.

**Chemical Controls:** See PPP-6.

### **Damping-Off (*Pythium* spp., *Fusarium* spp., *Rhizoctonia* spp.)**

**Symptoms:** Several soil-inhabiting fungi and fungal-like organisms that are almost universal in occurrence cause this disease affecting seedling watermelons. 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 watermelons (cool, wet weather) are usually most favorable for this disease. See Plant Pathology Fact Sheet PP-1.

**Chemical Controls:** Plant only fungicide-treated seed (most seed purchased is pre-treated). See PPP-6.

### **Downy Mildew (*Pseudoperonospora cubensis*)**

**Symptoms:** This fungus infects the leaves primarily. Lesions first appear on the crown leaves as yellow, mottled spots with indefinite borders. Older lesions are dark brown, contrasting sharply with the healthy tissue, and with only a small yellow border. As several lesions coalesce, the leaf curls inward toward the midrib and presents a “cupped hand” appearance. Under favorable conditions, downy mildew develops rapidly, resulting in a “burned-off” appearance over the entire field. The

pathogen is spread rapidly by means of airborne and rain-splashed spores. The causal fungus overseasons in southern Florida and thus the fungus moves northward gradually by air currents as spring watermelon planting proceeds northward. See Plant Pathology Fact Sheet PP-2.

**Chemical Controls:** Fungicide applications will effectively control the fungus if infection is diagnosed at an early stage. See PPP-6.

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

**Symptoms:** Infected plants develop a progressively severe wilt syndrome. Sectoring of wilt symptoms on one or more runners can occur. The vascular tissue in the crown develops a light brown to red discoloration. In severe cases, the entire root may become dark brown and a soft rot develops near the crown. The pathogen can be spread to new areas on seed on in soil transported by equipment, drainage water, and man. See Plant Pathology Circular 1025.

**Cultural Controls:** Plant watermelon varieties with resistance to this disease. However, even with resistant varieties, it is desirable to use new land or have a maximum number of years between crops on the same land. On land previously cropped in watermelon, some wilting of plants can occur even with resistant varieties and final thinning should be delayed as long as possible to eliminate the greatest number of wilt-susceptible plants before final stand is established. Contamination of new fields with soil from *Fusarium*-infested fields should be avoided.

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

**Symptoms:** This fungal pathogen can cause damping-off, crown rot, leaf spot, stem canker, and fruit rot of watermelon. Lesions in the cotyledons and leaves are round or irregular, brown and with faint concentric rings. Lesions on the crown and stem are brown and usually turn white with age. Lesions on fruit are brown, soft, nearly circular, and up to 4-6 inches in diameter. Lesions in stems and fruit may ooze of bleed an amber plant fluid: hence the name “gummy” stem blight. The pathogen is seedborne, spread by splashing rain from plant to plant, carried long distances on wind currents, and

“over-seasons” on old plant debris. See Plant Pathology Fact Sheet PP-27.

**Cultural Controls:** Use crop rotation. Turn vines when foliage is dry.

**Chemical Controls:** Plant only fungicide-treated seed. This disease requires fungicide applications to obtain adequate control. See PPP-6.

### **Phytophthora Blight and Fruit Rot (*Phytophthora capsici*)**

**Symptoms:** Any part of the plant can be infected by this fungus. However fruit symptoms are the most commonly observed. When the roots of stems are infected, wilting of the plant will occur. A whitish mold may appear on the outside of the stem. The fruit rot will appear as greasy blotches on the outer rind. A whitish, mold is likely to be present on the greasy tissue. This disease is most likely to occur during or after periods of excessive rains where water remained in the field.

**Cultural Controls:** Avoid fields known to have had this disease because the fungus can survive for many years in the soil. Provide for adequate drainage of water.

**Chemical Controls:** See PPP-6.

### **Powdery Mildew (*Sphaerotheca* sp.)**

**Symptoms:** Initially, older leaves have a reddish-brown bronzed appearance. The reader must realize that viral infections, chemical phytotoxicity and certain nutrient deficiencies can cause similar symptoms. At this point, microscopic examination is required to discern if characteristic spores of powdery mildew are present. At some point, obvious white, powdery fungal growth may occur. This has been an increasing problem for the past 5 years.

**Cultural Control:** None.

**Chemical Controls:** See PPP-6.

### **Rind Necrosis (Several bacterial species)**

**Symptoms:** Characteristic symptom of this disease is the development of light brown, dry corky spots in the rind which may enlarge and merge to

form rather extensive necrotic areas that rarely extend into the flesh. There are no external symptoms of rind necrosis, but infected fruits appear to have exceptionally tough rinds in the affected areas. The means of dissemination of the pathogen is not known nor is the etiology of the disease well understood, but apparently infection is limited to the fruits.

**Cultural Controls:** Watermelon varieties differ in the relative incidence and severity of rind necrosis.

### **Speckle or Moonspots (unknown cause)**

**Symptoms:** This name refers to the development of small white or yellow circular spots on the leaves and fruits. The cause or causes are unknown but this condition does not appear to be typical of an infectious disease. It is heritable. There is no control for this disease.

### **Tomato spotted wilt (Tomato spotted wilt virus)**

This disease has occurred on a few occasions in watermelon in Florida, but an adequate range of symptoms cannot be described. No controls are available

### **Mosaic (*Papaya ringspot virus type W*, *Watermelon mosaic virus 2*, *Zucchini yellow mosaic virus*)**

**Symptoms:** The most common symptom is mottling of the leaf (alternate light and dark green areas). However, one or more of the following symptoms may also be associated with mosaic: stunted growth, abnormal leaf shapes, shortened internodes, “bushy” and erect growth habit of the runner tips, and mottled or bumpy appearance of the fruit.

This disease is usually spread by winged aphids during feeding. The aphids pick the virus up from weed hosts such as the creeping cucumber or melonette, *Melothria pendula* L., in south Florida or alyce clover (*Alysicarpus* sp.) farther north in the State. Virus transmission requires 9 seconds or less of aphid feeding on watermelon. See Plant Pathology Circular 1184.

**Cultural Controls:** No effective commercial control but isolation of cucurbit plantings by use of surrounding plantings of solanaceous crops (tomato, potato, eggplant, pepper) might be helpful in delaying initial infection. Elimination of wild hosts in the vicinity of commercial plantings of watermelons and other cucurbits is critical to the control of these viruses.