

Pest Alert

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Florida Department of Agriculture and Consumer Services, Division of Plant Industry
Adam H. Putnam, Commissioner of Agriculture

Bacterial Fruit Blotch of Watermelon *Acidovorax avenae* subsp. *citrulli*

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Bacterial fruit blotch is caused by *Acidovorax avenae* subsp. *citrulli*. The disease was first detected in Florida in 1989 and was subsequently detected in South Carolina, North Carolina, Maryland, Delaware, and Indiana as the growing season progressed that year. It is suspected that the cause for the initial outbreak was seed infested with the bacterium. Since then, fruit blotch has been detected every year to varying degrees of significance in melon production areas nationwide.

In April, 2001, bacterial fruit blotch was detected on the watermelon variety 'Carousel' growing in a Florida transplant house. Infested seed from Syngenta, the producers of 'Carousel', is the suspected source of the outbreak. The company has issued a nationwide recall of this variety.

DISEASE DEVELOPMENT: The fruit blotch bacterium can be introduced into watermelon fields by infested seed, infected transplants, natural spread from alternate hosts (wild cucurbits?) or volunteer watermelon. The bacterium can be a surface contaminant of seed harvested from infected watermelon. Infected transplants represent the most important means of disease transmission because watermelon fruit blotch can spread throughout the transplant operation, can be asymptomatic on transplants and can lead to high numbers of infected transplants entering field plantings.

Bacterial fruit blotch disease development is favored by warm wet weather such as exists in Florida in May-June during the spring watermelon season and August-September during the fall watermelon season. The disease can develop quickly in these weather conditions. It can cause 100% infection from just a few primary infection sites within an infested field.

Bacteria within leaf lesions of infected transplants can cause infections on susceptible (2-3 week old) watermelon fruit. The naturally occurring waxy layer that develops on maturing watermelon hinders bacterial invasion and infection unless the fruit rind becomes injured and the protective wax layer is compromised.

SYMPTOMS: Initial symptoms on infected transplants are dark water-soaked areas on the underside of cotyledons and first leaves. As the disease progresses, necrotic lesions may appear on the foliage. Young seedlings may develop lesions on the hypocotyl, causing eventual collapse and death. Disease symptoms on foliage can progress throughout the growing season and may not be particularly obvious or may be confused with other diseases. Leaf lesions are generally light brown to reddish brown and will often spread along the midrib if the infected leaf. These leaf lesions act as inoculum reservoirs. Defoliation is not usually a factor with bacterial fruit blotch infections.

Symptoms on susceptible fruit begin as small water-soaked areas (a few millimeters in diameter) and rapidly expand into larger lesions with irregular margins. The entire surface of the fruit (except the ground lesion) may become covered with these dark green greasy-looking lesions within a few days. Older fruit lesions become necrotic and may crack, exposing the interior of the rind and the flesh of the melon. A whitish bacterial ooze may exude from the splits, and eventually, infected fruit will rot.



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CONTROL: Control of bacterial fruit blotch is best achieved through preventative measures. Avoid introduction of the bacterium into production fields by planting disease-free seed from reputable seed producers. Purchase transplants from seedling operations that have not developed any seedling symptoms of fruit blotch. Transplant growers should inspect seedlings and remove or destroy seedling flats with suspicious symptoms. Personnel working in transplant houses should minimize handling of seedlings. After contact with plants, hands, benches, containers and tools should be decontaminated and discarded plant material should be destroyed.

In field operations, watermelon culls and plant debris should be plowed under. New watermelon production areas should be located as far from previously farmed watermelon fields as possible. Volunteer watermelon seedlings and wild cucurbit weeds should be destroyed to remove inoculum sources and potential alternate hosts of the fruit blotch bacterium.

Fruit resistance to fruit blotch may also provide control. Susceptibility of fruit is related to rind color. Watermelons with light green rinds (e.g., Charleston gray) are the most susceptible to infection. Light and dark green striped fruits (e.g., Crimson sweet) are more resistant than the light-skinned varieties and the solid dark green varieties (e.g., Sugar baby) are the most resistant to bacterial infection.

The fruit blotch bacterium can move throughout a field by way of wind-driven rain aerosols or by mechanical means. No work should be performed in a wet, contaminated field. Copper-based fungicides can reduce the incidence of fruit blotch if treatments begin prior to fruit set.



Water soaking of the lower surface of the watermelon cotyledons
Photo credit: Tom Kucharek, UF/IFAS



Foliar lesions tracking main vein
Photo credit: Tom Kuckarek, UF/IFAS



Greasy-looking, water-soaked lesion on watermelon
Photo credit: Tom Kumcharek, UF/IFAS



Lesion along the midrib of leaf
Photo credit: Tom Kucharek, UF/IFAS



Advanced fruit lesions and the beginning of fruit cracking
Photo credit: Tom Kucharek, UF/IFAS



Advanced symptoms on cotyledons
Photo credit: Tom Kucharek, UF/IFAS



Advanced symptoms with fruit cracking
Photo credit: Tom Kucharek, UF/IFAS