



## **Anthracnose Caused by *Colletotrichum* sp. on Pepper<sup>1</sup>**

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In 1998, an El Nino year, rains were frequent in southern Florida and anthracnose on pepper (*Capsicum annum*, *C. frutescens*) fruit was widespread. Isolated but devastating damage occurred to pepper fruit. In one field, 10-20% of pepper fruit were severely infected. In 2001, the weather was not highly conducive to the disease; however it was found on one variety in east Florida and on chili peppers in north Florida. The disease occurs during wet rainy weather or when introduced on infested seeds. Since the marketing of mature bell peppers that turn yellow or red, anthracnose has become a problem in seasons that are wet and warm.

### **Causal Organism**

Anthracnose is caused by fungi in the genus *Colletotrichum*, which is a very common group of plant pathogens, and they are responsible for diseases on numerous plant species worldwide. Identification of *Colletotrichum* to species is usually based on more than one characteristic, such as physical appearance and pathogenicity on host(s). Many species of *Colletotrichum* infect more than one host and, to confound identification, more than one *Colletotrichum* sp. may be present on one host. At least three species of *Colletotrichum* (*C.*

*gloeosporiodes*, *C. capsici*, and *C. coccodes*) are reported to cause this disease on pepper in Florida.

### **Symptoms**

*Colletotrichum* is capable of causing disease on virtually all parts of the pepper plant during any stage of plant growth. However, fruit lesions are the most economically important aspect of this disease. Fruit symptoms initially begin as water-soaked lesions that become soft, slightly sunken, and become tan. The lesions can cover most of the fruit surface and multiple lesions occur (Figure 1). The surface of the lesion becomes covered with the wet, gelatinous spores from salmon-colored fungal fruiting bodies (acervuli) with numerous black spines (setae) (Figure 2). Concentric rings of the acervuli are common within the fruit spots. In some cases, the lesions are brown, not orange, and then black from the formation of setae and sclerotia (a dark, fungal survival structure) (Figure 3).

### **Disease Cycle and Epidemiology**

The fungus survives in and on seeds. Anthracnose is introduced into the field on infected transplants or it can survive between seasons in plant debris or on weed hosts. Alternative hosts include

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**Figure 1.** Mature pepper fruit exhibiting multiple lesions of Anthracnose.



**Figure 2.** Anthracnose lesion contains salmon-colored spore masses in concentric rings on mature pepper fruit.



**Figure 3.** Spores of *Colletotrichum* released from a fungal fruiting body (acervulus) with numerous black, spines (setae) on pepper.

weeds and other plants in Solanaceae (tomato, potato, eggplant) although infections of these hosts are extremely rare in Florida.

Fruit are infected when spores of the fungus or infested debris is rain splashed onto pepper plants. New spores are produced within the infected tissue and then are dispersed to other fruit. Workers may also move spores with equipment or during handling of infected plants.

Infection usually occurs during warm, wet weather. Temperatures around 80° F (27° C) are optimum temperatures for disease development, although infection occurs at both higher and lower temperatures. Severe losses occur during rainy weather because the spores are washed or splashed to other fruit resulting in more infections. The disease is more likely to develop on mature fruit that is present for a long period on the plant, although it can occur on both immature and mature fruit.

### Control

Control of the disease is through integrated management techniques. The disease should not be introduced on infected plants. Only seeds that are pathogen-free should be planted. Transplants should be kept clean by controlling weeds and solanaceous volunteers around the transplant houses. The field should have good drainage and be free from infected plant debris. If disease was previously present, crops should be rotated away from solanaceous plants for at

least 2 years. Sanitation practices in the field include control of weeds and volunteer peppers plants.

Resistance is available in some varieties of chili peppers but not in bell peppers. For bell pepper production, choose cultivars that bear fruit with a shorter ripening period which may allow the fruit to escape infection by the fungus. Wounds in fruit from insects or other means should be reduced to the extent possible because wounds provide entry points for *Colletotrichum* spp. and other pathogens like bacteria that cause soft rot. For late-maturing peppers, when disease is present, apply a labeled fungicide several weeks before harvest. Check the with your county Extension agent for a suitable, labeled product. The disease can be controlled under normal weather conditions with a reasonable spray program. At the end of the season, remove infected plant debris from the field or deep plow to completely cover crop diseases.