

Pineapple Disease of Sugarcane ¹

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Pineapple disease is an economically important sugarcane disease that occurs in almost all countries where sugarcane is grown. The disease is caused by the fungus *Ceratocystis paradoxa* which induces seed piece decay following planting. The disease derives its name from the scent produced by rotting seed pieces, which is similar to that of ripe pineapples. In the Everglades Agricultural Area of Florida, the disease has been implicated in causing poor initial stands of sugarcane, although its exact impact on Florida sugarcane production is not known.

SYMPTOMS

Shortly after infection, the internal tissue of the seed piece turns red and eventually black (Figure 1). The black coloration results from the production of fungal spores within the seed piece. Nodes act as partial barriers to the spread of rotting, but with susceptible varieties, entire seed pieces may become colonized by the fungus. The disease severely retards bud germination, shoot development and early shoot vigor. Pineapple disease can result in young plant-cane crops having a patchy, uneven appearance (Figure 2). When severe, the disease may reduce

germination over large areas. Although pineapple disease is not considered important in standing cane, infection may occur if the stalks are physically damaged or stressed.

CAUSAL AGENT

The pineapple disease fungus, *Ceratocystis paradoxa*, grows readily in culture and can easily be isolated from diseased tissue.

At least some variability has been shown to occur within *Ceratocystis paradoxa*, but evidence for multiple races of the pathogen is lacking. *Ceratocystis paradoxa* also causes diseases of pineapple, banana, cacao, coconut and oil palm.

Ceratocystis paradoxa produces several types of spores which are important in its survival and spread. These spores, produced by the millions on the internal tissues of infected seedpieces, are released into the soil upon seedpiece decay. There, the spores may survive for several years, serving as a source of inoculum for the next crop.

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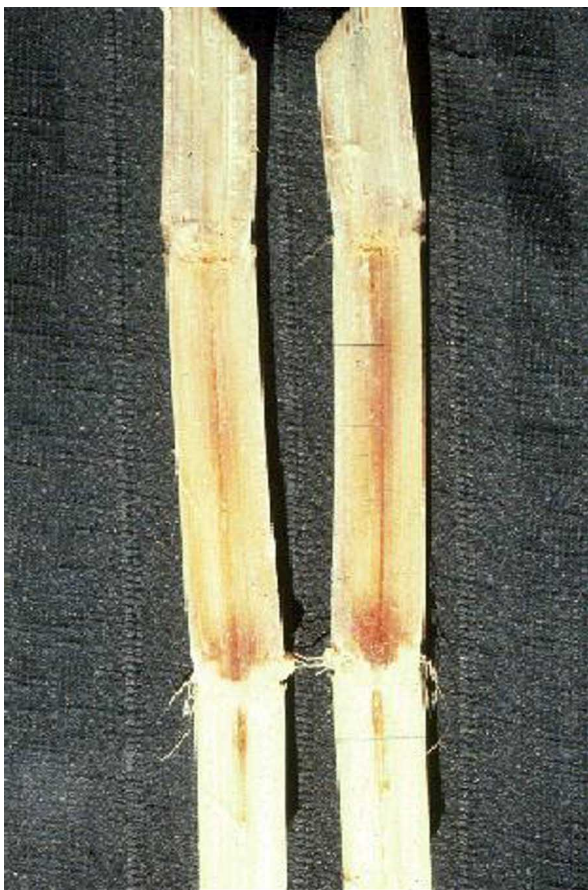


Figure 1. Internal tissue discoloration caused by Pineapple Disease.



Figure 2. Poor germination due to Pineapple Disease.

SPREAD OF THE DISEASE

Pineapple disease is essentially soilborne, being transmitted by the fungal spores present in the soil. The fungus is found mainly in the top 25 cm of the soil profile.

Any factor that delays germination of the buds on the seed piece increases the likelihood of infection. Excessively deep planting, wet or dry soil conditions and low temperature are all conducive to the development of the disease. Long hot-water treatments used to control other diseases may have a detrimental effect on germination and thus may actually increase susceptibility to pineapple disease. Even short hot-water treatments, which usually stimulate germination, may result in increased susceptibility. In general, rapid germination decreases the impact of the disease.

Infection of standing cane occurs through wind-blown or rain-splashed spores gaining entry through damaged tissue.

PREVENTION AND CONTROL

The use of resistant cultivars is often the easiest, most economical method for controlling plant diseases. Research has shown a wide range in sugarcane cultivar susceptibility to the disease in Florida. If susceptible cultivars are planted, there are a number of ways to minimize the effects of the disease.

If possible, planting should take place when conditions favor rapid germination. For example, the use of seed cane that is relatively young improves the prospect of rapid germination, thus hindering development of the disease. In Florida, germination is most rapid early in the season (Sept. - Dec.) when soil temperatures are warmest.

Some of the most severe outbreaks of pineapple disease in Florida have been in successively-planted fields. Since pineapple disease is a soil-borne disease, crop rotation or a fallow period between cane crops may prove to be of some benefit in reducing its impact.

Site selection and site preparation may be important tools in limiting the impact of pineapple disease. Susceptible cultivars should be planted on dry, well-drained soils. Cool, wet conditions inhibit seed piece germination more severely than they inhibit fungal growth. Preventing standing water on planted soils, therefore, will dramatically reduce the effects of pineapple disease.

Seed piece infection by pineapple disease frequently proceeds from the exposed cut ends to the center of the seed piece. Therefore, the use of seedpieces containing at least three nodes increases the likelihood that buds closer to the center will germinate. Similarly, care should be taken to minimize the amount of cracking and wounding of seedpieces, since the pathogen also enters through wounds. Since mechanically-harvested seedpiece billets are typically shorter and have more damage than whole stalks planted by hand, growers may want to compensate by planting mechanically-harvested seedcane at higher densities

In Florida, propiconazole (Tilt) is registered for use as a hot or cold water dip or as a seedpiece topical spray to be applied as the seed is being transported by mechanical conveyor to the furrow. The former method of application is the more efficacious, but treating large quantities of seed in this manner is frequently infeasible.