UF IFAS Extension UNIVERSITY of FLORIDA

SS-AGR-205

Sugarcane Pineapple Disease or Sugarcane Pineapple Set Rot[1]

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Pineapple disease, recently renamed pineapple set rot (http://www.isppweb.org/names_sugarcane_common.asp), 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 (Girard and Rott 2000). 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.

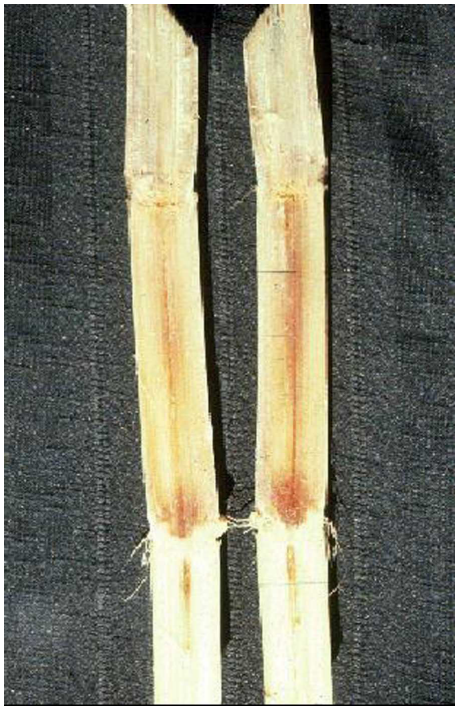

Figure 1. Internal tissue discoloration caused by pineapple disease. Credits: Richard Raid, UF/IFAS

1. This document is SS-AGR-205, one of a series of the Agronomy Department, UF/IFAS Extension. Original publication date March 1991. Revised January 2006 and November 2015. Visit the EDIS website at http://edis.ifas.ufl.edu. This publication is also a part of the *Florida Sugarcane Handbook*, an electronic publication of the Agronomy Department. For more information, contact the editor of the *Sugarcane Handbook*, H. S. Sandhu (hsandhu@ufl.edu).

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Figure 2. Poor germination due to pineapple disease.
Credits: Richard Raid, UF/IFAS

Causal Agent

The pineapple disease fungus, *Ceratocystis paradoxa*, grows readily on culture media in the laboratory 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. Two types of asexual spores (conidia) are produced: brown, thick-walled conidia produced in chains; and hyaline (clear), thin-walled conidia which, are more short-lived. Additionally, ascospores produced by a sexual stage are produced within small, dark-brown to black, vase-like structures called perithecia. All three spore types, produced by the millions on the internal tissues of infected seed pieces, are released into the soil upon seed piece decay. There, the spores may survive for several years, serving as a source of inoculum for the next crop.

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 sugarcane 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. When 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 (September–December) 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. Flooded fallow, a rotation practice common to the Everglades Agricultural Area of south Florida, is more beneficial to pineapple disease management than dry fallow.

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 seed pieces 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 seed pieces, since the pathogen also enters through wounds. Since mechanically-harvested seed piece billets are typically shorter and have more damage than whole stalks planted

by hand, growers may want to compensate by planting mechanically-harvested seed cane at higher densities.

In Florida, propiconazole (Tilt®) is registered for use as a hot or cold water dip or as a seed piece 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.

Reference

Girard J.C. and P. Rott 2000. "Pineapple disease". In *A guide to sugarcane diseases*, edited by Philippe Rott, Roger A. Bailey, Jack C. Comstock, Barry J. Croft, and A. Salem Saumtally, 131-35. Montpellier, France: CIRAD/ISSCT, La Librairie du Cirad.