



## Phytophthora crown and root rot



## Diagnostics update

- 🍓 First *Phytophthora* detection for fall season: 24 October 2017.
- 🍓 Since then, 110 strawberry samples received in the diagnostic lab; over half (60) diagnosed with *Phytophthora* crown and root rot.
- 🍓 Fortuna (Radiance), Monterey, Fronteras, Petaluma, San Andreas, Ventana and numerous proprietary cultivars from Santa Maria, Oxnard, Watsonville, even Mexico...



## Phytophthora crown and root rot

caused by:

*Phytophthora cactorum*,  
*P. citricola*,  
*P. nicotianae*,  
*P. fragariae*\*

\* causes a similar disease known  
 as red stele



## Phytophthora crown and root rot

Infected transplants often  
 exhibit:

- stunting (early season)
- plant collapse (mid- to late- season)

due to limited new root  
 development.



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Healthy

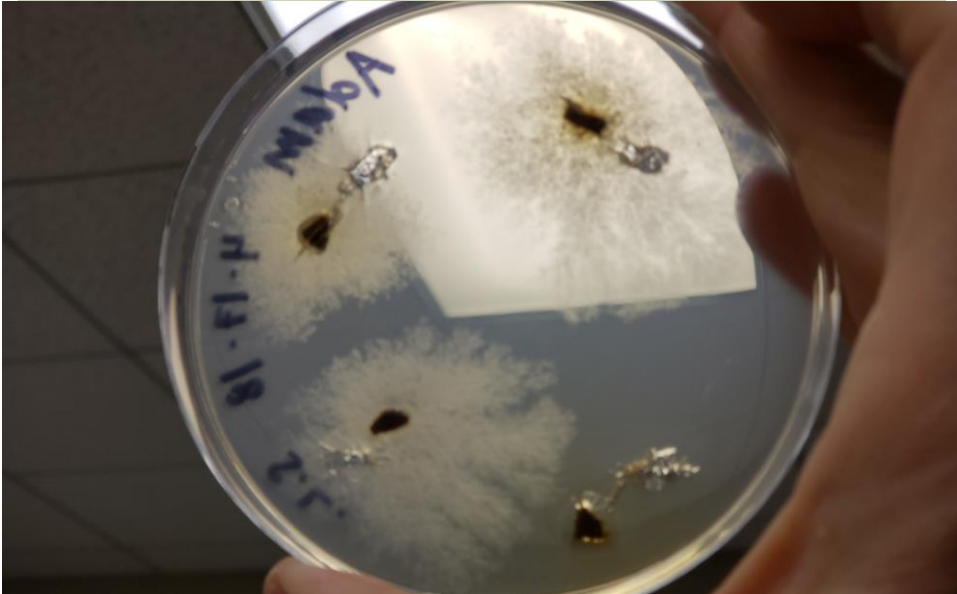
vs

Stunted

## *Phytophthora* Diagnostics



## *Phytophthora* Diagnostics



## 2017: The Fall of *Phytophthora*

The DNA of 30 *Phytophthora* isolates from these 2017-2018 samples was sequenced to determine what species was responsible for this outbreak:

**all isolates were identified as  
*Phytophthora cactorum***



Dr. Mojtaba Mansouripour

**Phytophthora Crown & Root Rot**  
Production Guideline by Greg T. Browne & R.G. Bhat

Issue 9.1 June 2011

The California Strawberry Commission Production Guidelines are produced in cooperation with scientists who conduct research related to strawberry production. These guidelines are a tool for growers, providing critical scientific background information on diseases and pests common to strawberry production in California. For copies of this guideline or others in the series, visit [www.calstrawberry.com](http://www.calstrawberry.com).

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Phytophthora crown and root rot caused by *Phytophthora cactorum* is a disease of long-standing importance in strawberry. It is responsible for sporadic but serious production losses in California strawberry nurseries and fruiting fields. Pre-plant soil fumigation, improved cultural practices, and systemic fungicides have helped to minimize the losses, but the pathogen's ability to survive indefinitely in soil and its capacity for rapid reproduction have prevented its eradication from strawberry production systems. The pathogen causes loss primarily by killing plants, but it also can reduce growth and yield through sub-lethal infections.

**Symptoms of the disease**  
Symptoms of disease caused by *P. cactorum* vary with stage in the production system and time of year. Early in the season, either at nurseries or fruiting fields, infected plants may exhibit stunting. As weather warms, the most notable symptom of infection, at least on susceptible cultivars, is plant collapse (Figure 1 and 2) associated with crown rot (Figure 3). However, it is difficult to reliably distinguish crown necrosis caused by *P. cactorum* from that induced by *Colletotrichum acutatum* or other pathogens, especially in later stages of disease. Furthermore,



Figure 1. Symptoms of *Phytophthora* crown and root rot caused by *Phytophthora cactorum*. Typical "plant collapse" in a commercial fruiting field.



Figure 2. Symptoms of *Phytophthora* crown and root rot caused by *Phytophthora cactorum*. Typical "plant collapse" in a commercial fruiting field.



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Production guidelines for managing this disease can be found:

<http://www.calstrawberry.com/en-us/Pest-Management/Diseases>

## Phytophthora crown and root rot

UC Breeding program ratings pre-2014	
Cultivar	Phytophthora cactorum resistance
Ventana	2.5
Camarosa	3.2
Palomar	3.3
Benicia	3.7
Grenada	3.9
Monterey	3.9
Petaluma	3.9
Fronteras	4.1
Portola	4.1
San Andreas	4.1
Cabrillo	4.2
Albion	4.5

Scale of 1 to 5;  
5 being completely  
resistant

*Phytophthora*: Not a main target for strawberry breeding programs outside of Florida



## Phytophthora crown and root rot management

Active ingredient	Trade name	FRAC Code
Mefenoxam	Ridomil Gold SL	4
Phosphorous acid	Fosphite, Fungi-Phite, K-Phite etc...	33

## Chemigation trial for Phytophthora crown and root rot management



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## Chemigation trial for Phytophthora crown and root rot management



**MATERIALS POSTED AT:**  
**[WWW.STRAWBERRY.CALPOLY.EDU](http://WWW.STRAWBERRY.CALPOLY.EDU)**

**Thank YOU!**

- Growers, PCAs, Farm Advisors
- California Strawberry Commission
- Syngenta