

Macrophomina and Fusarium: New Strawberry Collapse Diseases in California

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New Soilborne Issues

- **Started as early as 2005.**
- **Plant wilting, poor growth, collapse, discoloration of crowns, plant death.**
- **Two different pathogens, similar symptoms:**
 - **Macrophomina phaseolina**
 - **Fusarium oxysporum**
- **Symptoms similar to Phytophthora, others.**

New Soilborne Issues

- **Distribution:**
 - **Macrophomina: Orange, Ventura, Santa Barbara counties. (Also in Alameda, Sacramento counties.)**
 - **Fusarium: Ventura County.**
- **Mostly associated with alternative fumigant treatments (non-MB/CP chemicals, bed applications).**

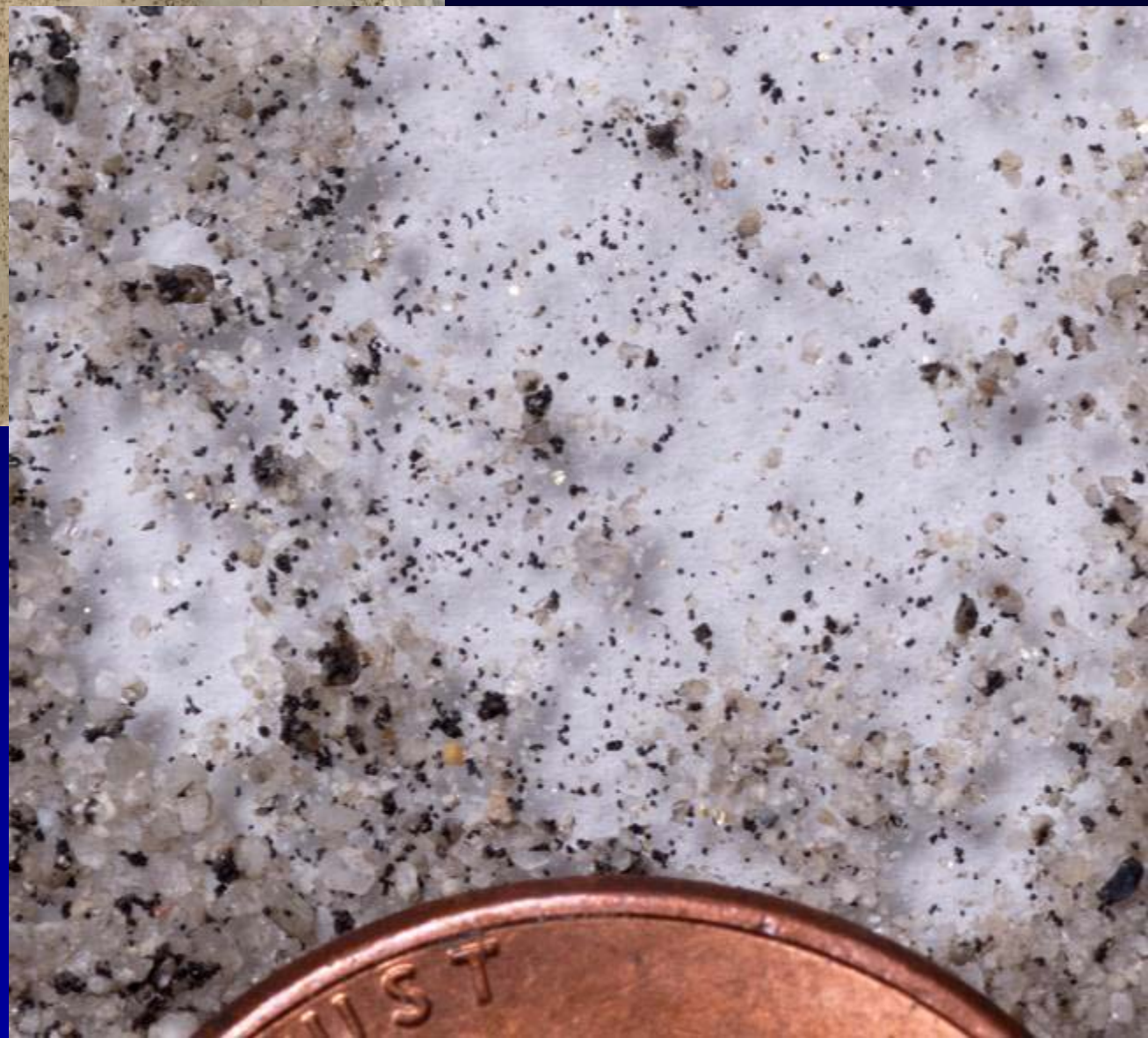
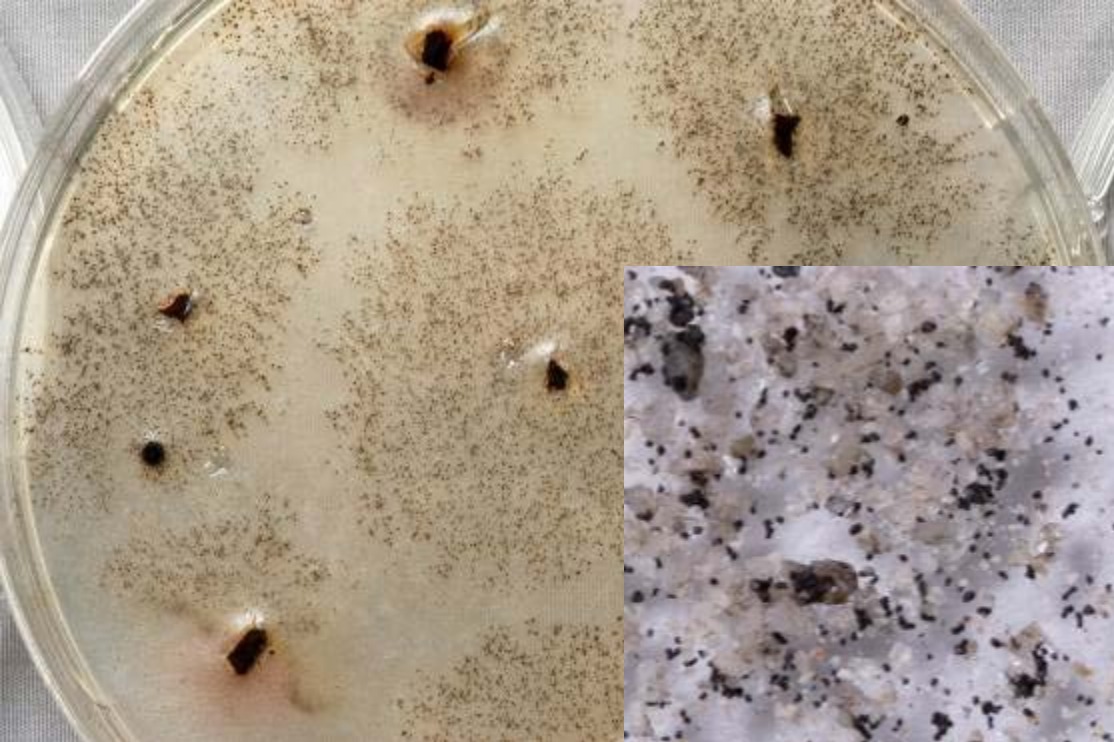
Macrophomina phaseolina







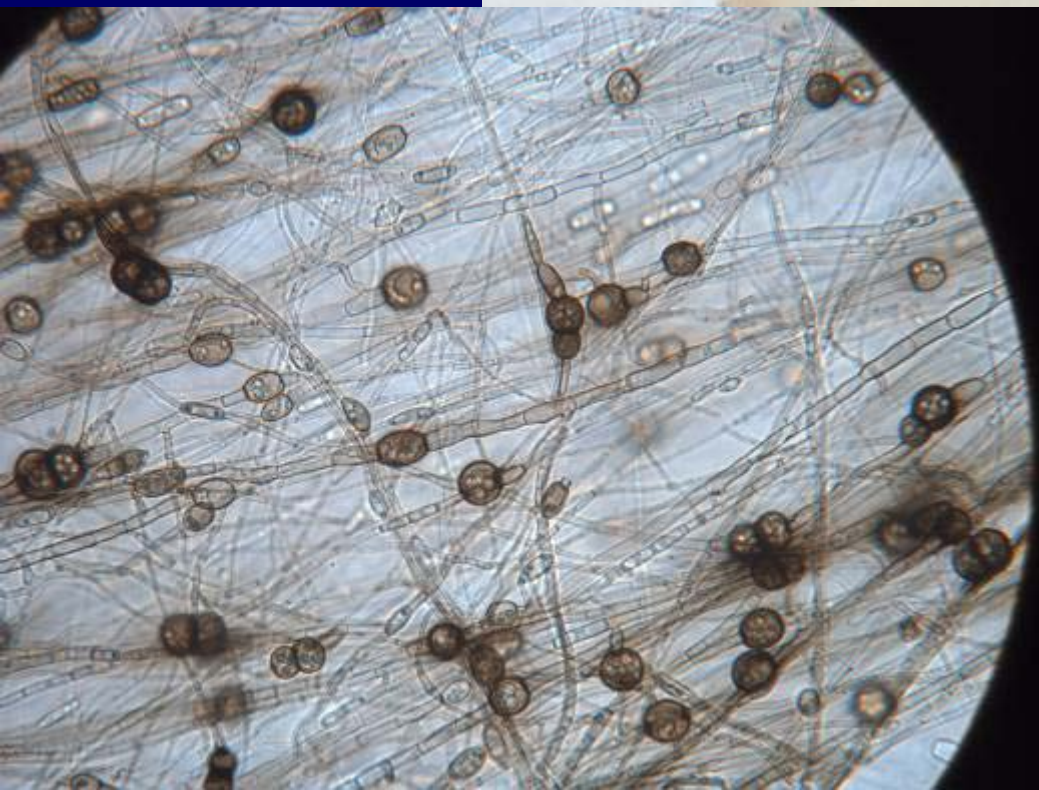
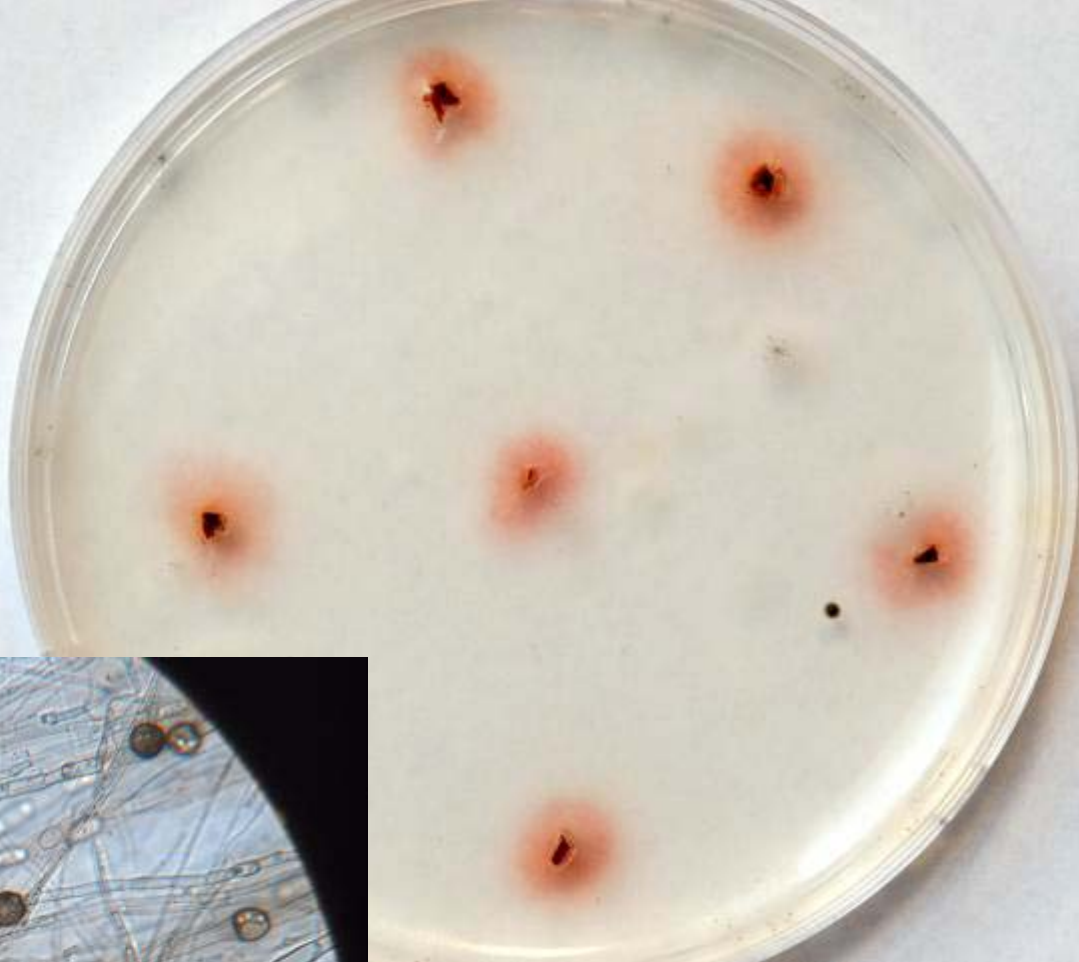
M. p.





Fusarium oxysporum





Worldwide Distribution

- **Macrophomina:**
 - California, Florida, Illinois, Egypt, France, India, Israel
- **Fusarium:**
 - California, Argentina, Australia, Spain, South Korea, Japan

Research Goals

- **Study biology, disease cycle, epidemiology.**
- **Characterize the pathogens.**
- **Pathogen host ranges.**
- **Cultivar susceptibility / resistance.**
- **Pre-plant and/or post-plant treatments.**

Control



Cultivar Susceptibility

<u>Cultivar</u>	<u>Mean Disease Severity</u>
Seascape	2.9 a
Ventana	3.9 b
Albion	4.0 b
Camarosa	4.2 bc
Diamante	4.9 c

LSD (P=0.05) = 0.8

Severity scale: 1=no symptoms, 2=a few lvs showing decline, 3=slight plant dieback, 4=moderate dieback, 5=complete collapse.

Inoculations: isolate 3

Albion

Ventana

Seascape



Field Trials: Soil Treatments

MeBr/Pic (50/50), 200 lb

MeBr/Pic (50/50), 300 lb

InLine (32/62), 300 lb

InLine (32/62), 400 lb

Midas EC (33/67), 200 lb

Midas EC (33/67), 300 lb

Pic Chlor EC, 200 lb

Pic Chlor EC, 300 lb

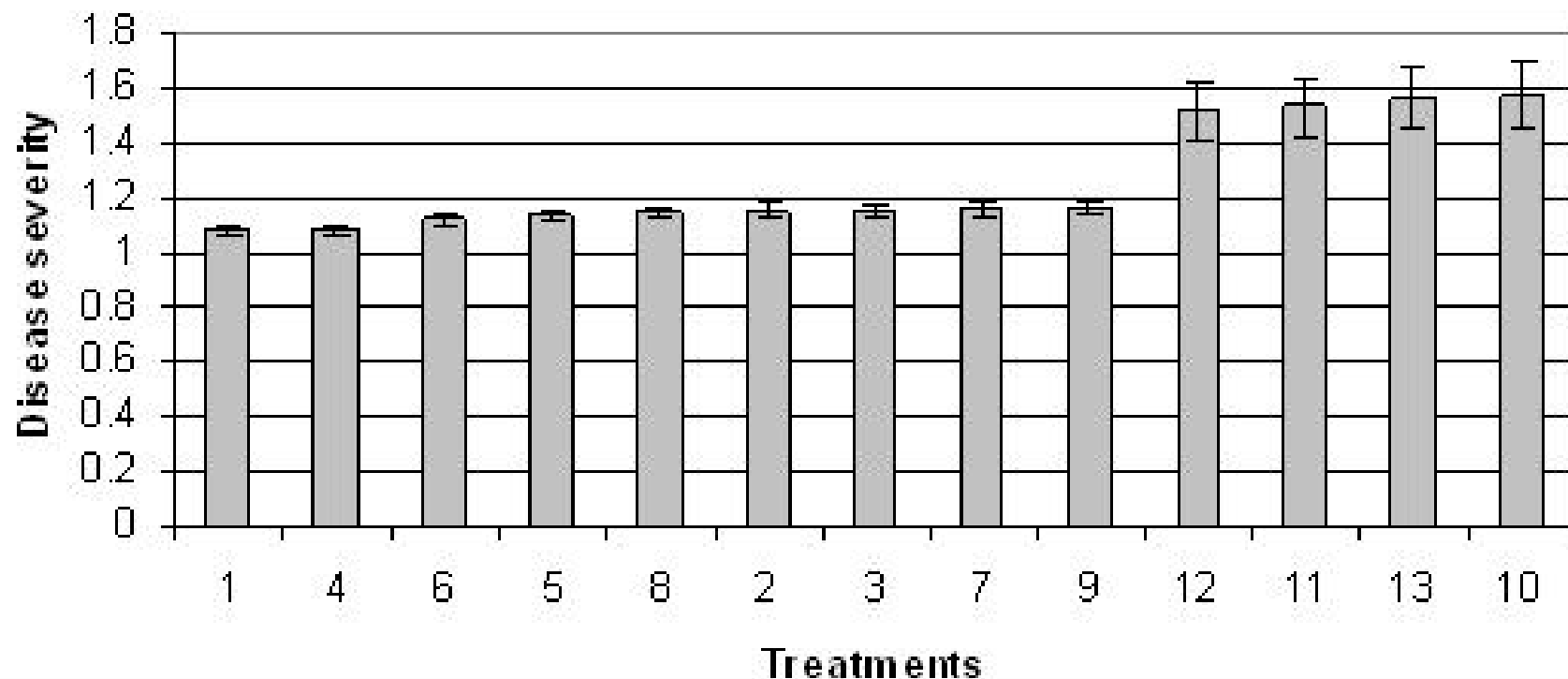
Pic 60, 300 lb

Untreated

(Topsin M 4.5F post-plant applications)



Field fumigation study: 2009



Disease severity scale:

1 = no symptoms; 2 = slight stunting and decline;

3 = significant stunting and decline; 4 = collapse and death

Management

- **Select sites without history of problem.**
- **Crop rotation away from strawberry.**
- **Fumigation (but which materials?).**
- **Plant a resistant or less sensitive cultivar.**
- **Avoid stressing plants.**
- **Avoid moving infested soil.**

Acknowledgments

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