

Strawberry Plant Collapse: Recent Developments in California

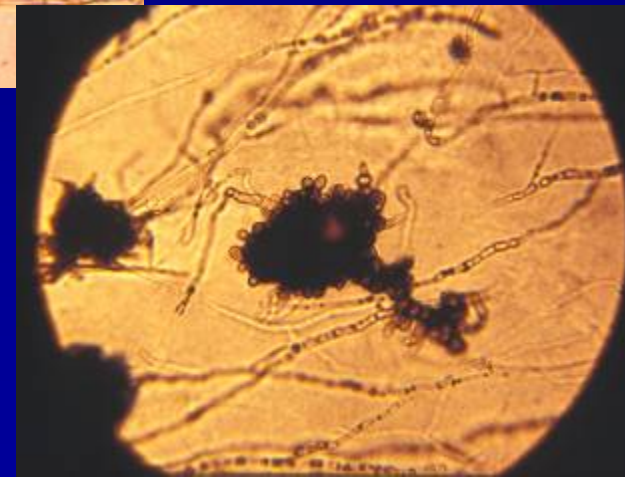
**Steven Koike
University of California
Cooperative Extension**

Situation: 2005 to Now

- **Plant collapse occurring in fumigated fields.**
- **Affected areas enlarge each year.**
- **Additional fields are found each year.**
- **Cases seen in central coast, southern California, south central coast.**
- **Severe dieback/death occurs late in season.**
- **Associated with plant stress (weather, fruit load) and changes in fumigation practices (Telone C35, InLine).**

Strawberry Soilborne Pathogens

- “Major”
 - Verticillium
 - Phytophthora
 - Colletotrichum
- “Minor”
 - Rhizoctonia
 - Pythium
 - Cylindrocarpon
 - Macrophomina
 - others



Recent Findings

- **Macrophomina phaseoli is most often associated with these collapse problems.**
- **A Fusarium has also been associated with the plant collapse.**
- **The “major” pathogens have not been found in these cases.**



**Macrophomina
phaseolina**







Control



Crown inoculation



Crown inoc.: 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.

Crown inoc.: Isolate virulence

<u>Isolate</u>	<u>Mean Disease Severity</u>
14	2.3 a
12	3.8 b
4	4.1 bc
11	4.1 bc
1	4.2 bc
2	4.3 bc
13	4.3 bc
3	4.5 c

LSD (P=0.05) = 0.7

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

Crown inoculation: cv. Camarosa

iso 3

iso 4

uninoculated



Crown inoculation: cv. Albion

iso 3

iso 14

uninoculated



Crown inoculation: isolate 3

Albion

Ventana

Seascape



Crown inoculation: cv. Seascape

iso 3

iso 14

uninoculated







Root inoculation

Root inoculation





Fusarium









Management: Preliminary Advice

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

Summary

- **Collapse associated with Macrophomina and Fusarium.**
- **Fusarium role is still uncertain.**
- **Varieties may vary in susceptibility.**
- **Some virulence differences exist among Macrophomina isolates.**
- **Plant collapse is associated with fields treated with MB+CP alternatives.**

Proposed Research

- Field trials w/ pre-plant soil treatments.
- Field trials with post-plant fungicides.
- Evaluate cultivar susceptibility.
- Study biology, soil survival, host range, soil detection tests, etc.
- Team: Koike, Gordon, Ajwa, Daugovish, Bolda.

Acknowledgments

- Strawberry growers in California
- California Strawberry Commission
- Dan Legard, Maria Vidauri
- Mark Bolda, Oleg Daugovish, Dan Marcum
- Paul Penza, Bob Ruiz, and other industry personnel

