

Diagnosing Problems in Strawberry

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The need for careful diagnosis

- To best manage a problem one needs to know what is causing it.
- The problem dictates the measures taken.
- Guessing is risky on both the biological and the business sides.

A. What is wrong?



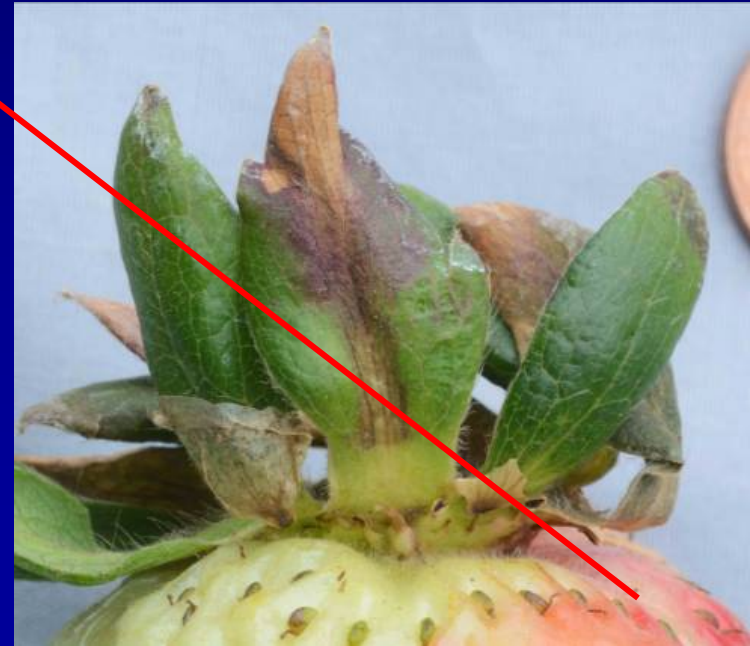
B. What can be done?



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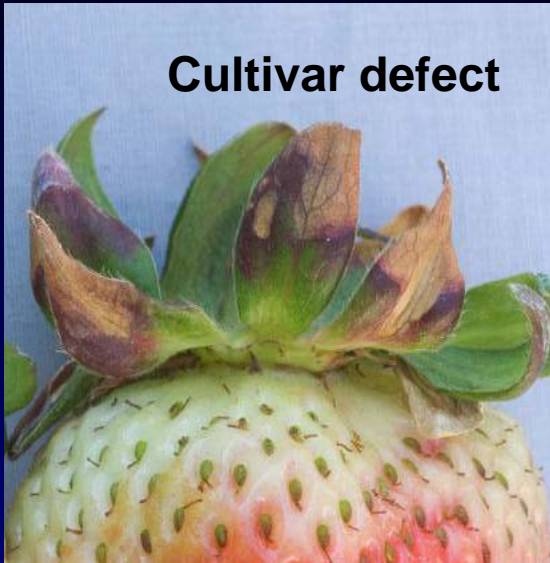


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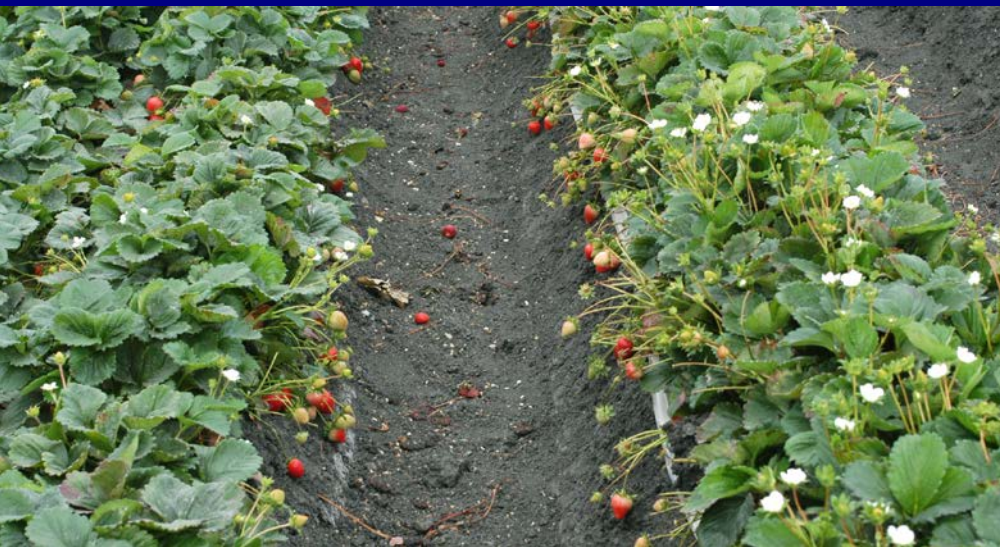
Cultivar defect



Zythia infection



B. What can be done?



Symptoms and signs: What does the problem look like?

- **Type of symptoms?**
- **Biotic vs. abiotic vs. physiological?**
- **Placement of the symptoms?**
- ***Status of roots and crowns?**
- **Presence of signs?**
- **Referred symptoms?**
- **Age / size of the plant?**
- **Comparison with healthy plant?**

Patterns:

Where is the problem occurring?

- **Distribution at the site?**
- **Along edges?**
- **In clusters of plants?**
- **In repeating patterns?**
- **Completely random?**
- **Uniform and affecting all plants?**
- **Affecting multiple fields?**
- **Strawberry only? Other crops / weeds?**

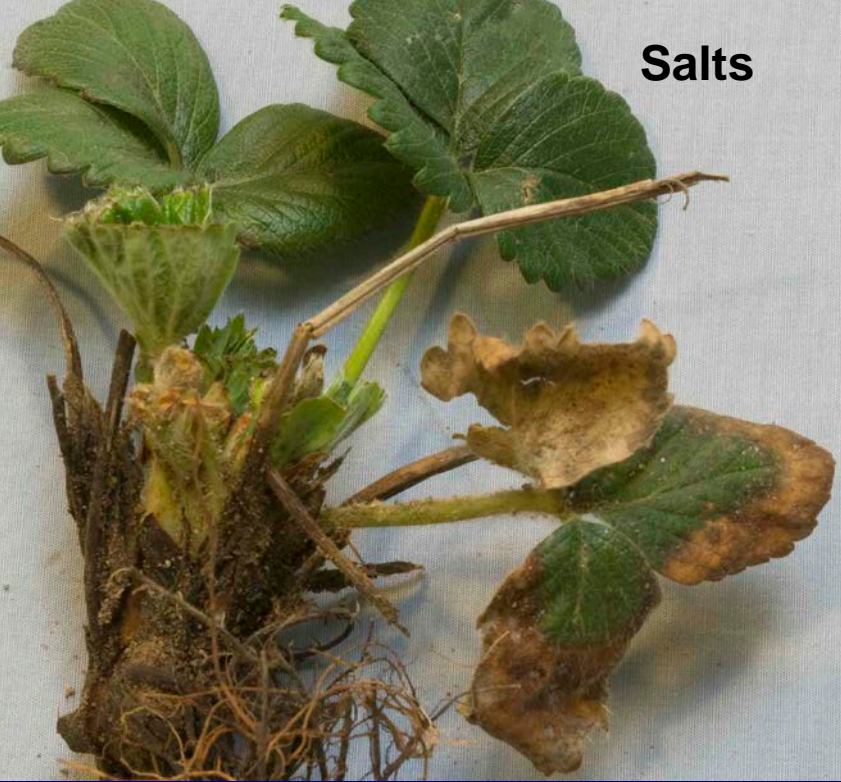
Time and space associations: What factors might be linked?

- **Events?**
 - **Production practices / irrigation**
 - **Spray / fertilizer applications**
 - **Weather patterns and changes**
 - **Time of year**
- **Locations?**
 - **Same site / region**
 - **Adjacent sites, pastures, water sources**

Time and space associations: What factors might be linked?

- **Plant factors?**
 - Transplant source, batch
 - Cultivar (are different cvs. affected?)
 - Plant stress factors
- **Pest factors?**
 - Insect vectors
 - Weeds
- **Context in time and space: what is going on around planting?**
- **Field records? Lab test results?**









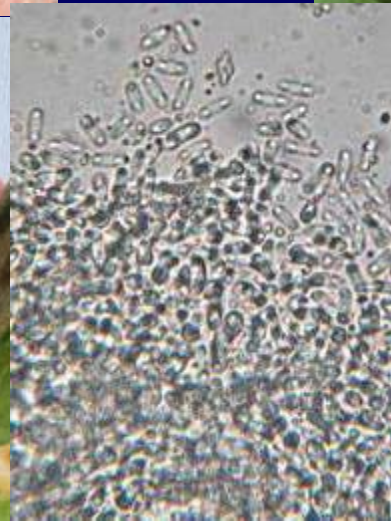
Physio.



Zythia



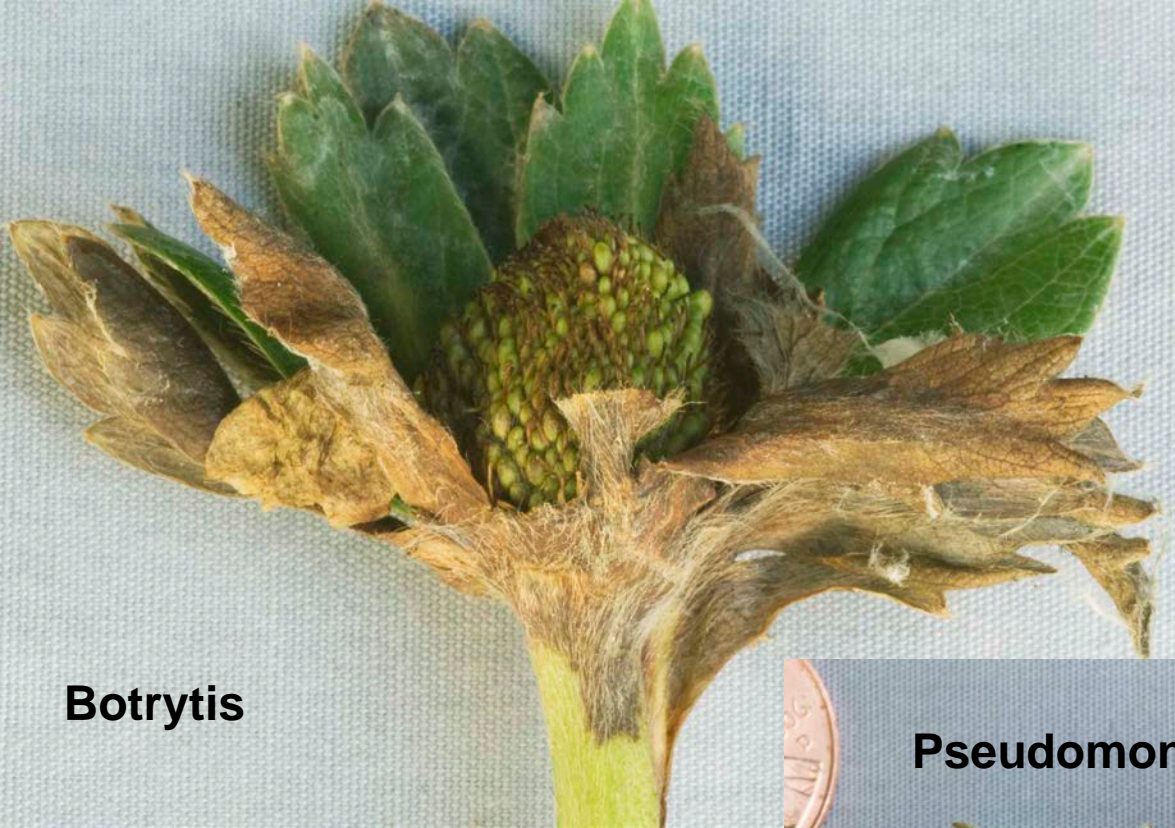
Zythia



Physio.







Botrytis

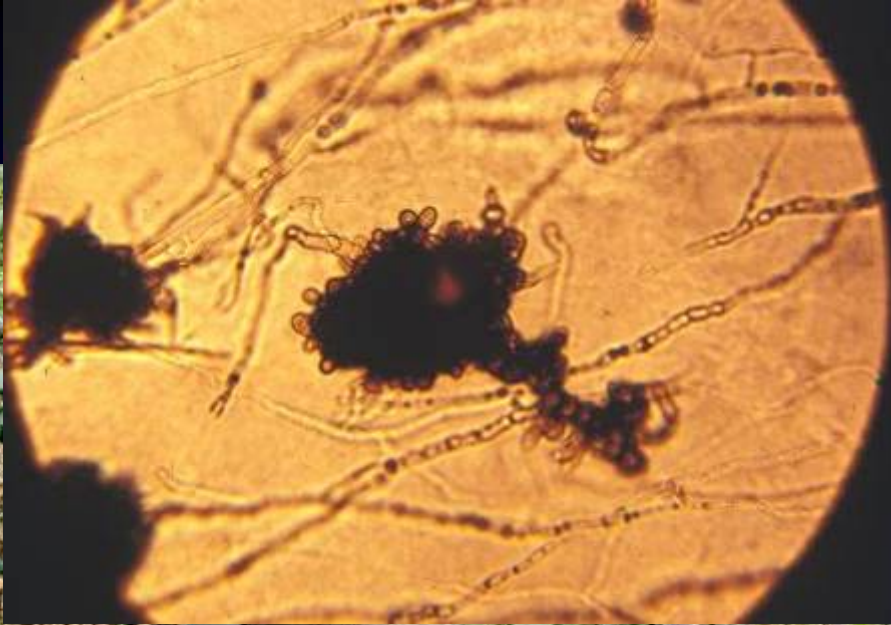


Pseudomonas





Verticillium







Fusarium



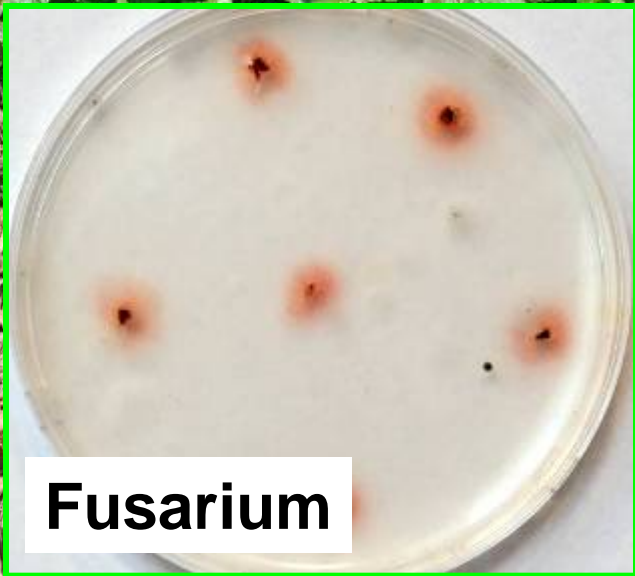
Macrophomina



Macrophomina



Fusarium



Fusarium



Macrophomina





Fusarium



Macrophomina



Fusarium



Macrophomina





?

Diagnosis:
Macrophomina
Fusarium
Verticillium
Other



?

Inoculations: *Macrophomina* isolate 3



Albion

Ventana

Seascape

Cultivar comparisons

<u>Cultivar</u>	<u>Macroph.</u>	<u>Fusarium</u>
Chandler	“resistant”	susceptible
Seascape	“resistant”	susceptible
Portola	susceptible	“resistant”
San Andreas	susceptible	“resistant”
Ventana	susceptible	“resistant”

* Resistant ≠ Immune



Verticillium wilt: Future concerns

Verticillium wilt



Strawberry



Lettuce

**“Early stage
Macrophomina”**



Transplant establishment problems



Macrophomina update: still out there, spreading, no solution

