

# **Vegetable Diseases: Updates and Recent Developments**

**Steven T. Koike  
TriCal Diagnostics  
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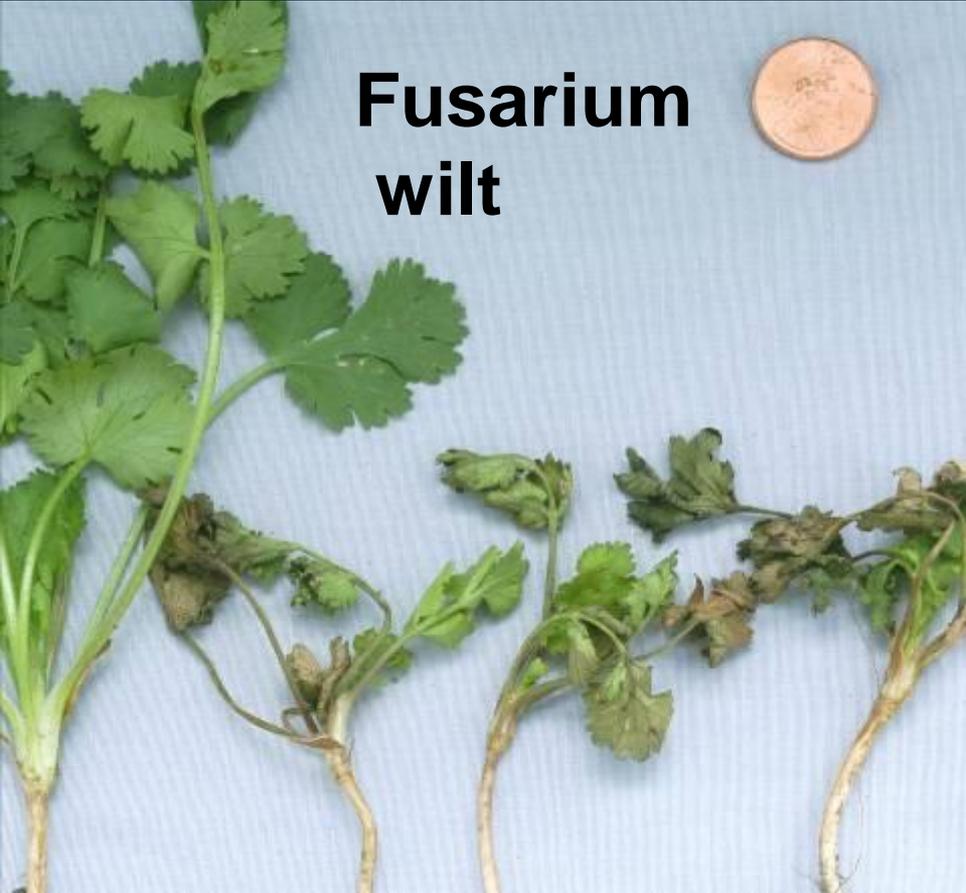
# Challenge of diagnostics in plant pathology

- **Dealing with microorganisms**
- **Cannot rely only on symptoms:**
  - **May not be “diagnostic”**
  - **Different diseases: same symptoms**
  - **Field/weather conditions: same symptoms**
- **Generally requires lab analysis**





**Fusarium wilt**

A photograph showing several cilantro plants on a light blue surface. One plant on the left is healthy and green. The other plants to its right are wilted and have brown, necrotic stems and leaves. A US penny is placed to the right of the plants for scale.

**Fusarium  
wilt**

A photograph showing three cilantro plants with their roots exposed on a light blue surface. The plant on the left is healthy. The middle and right plants show root rot, with thick, dark, necrotic lesions on the stems and roots. A US penny is placed to the left of the plants for scale.

**Rhizoctonia root rot**



**Fusarium wilt**





**Pseudomonas**



**Alternaria**

# Bacterial leaf spot





**Alternaria**

# Cucumber mosaic virus





## Impatiens necrotic spot virus





## Tomato spotted wilt virus





**Alfalfa mosaic virus**

# Bacterial diseases on Apiaceae in California: *Pseudomonas syringae*

- Celery: *P. syringae* pv. *apii*
- Cilantro: *P. syringae* pv. *coriandricola*
- Parsley: *P. syringae*
- Fennel: *P. syringae*







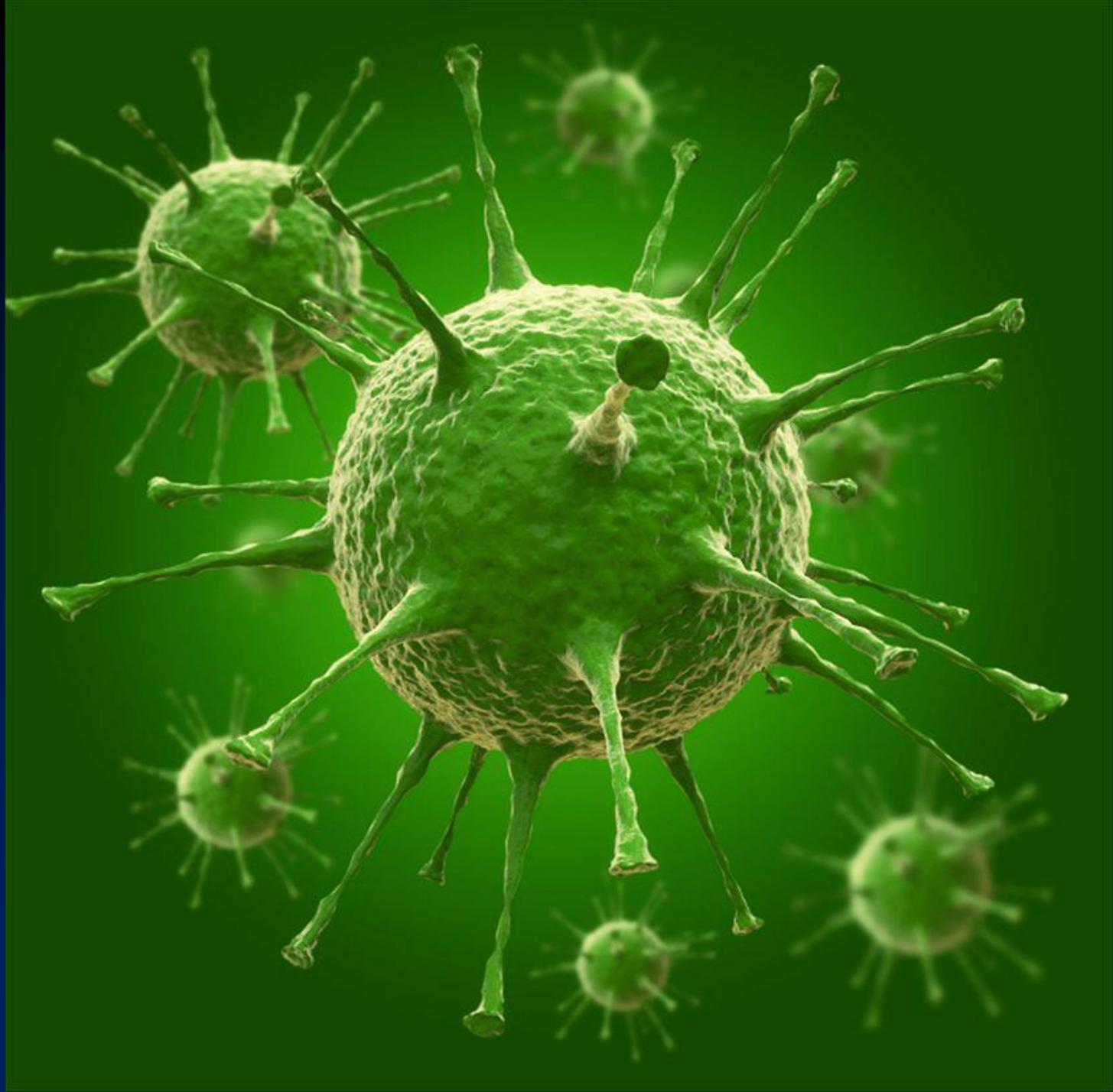


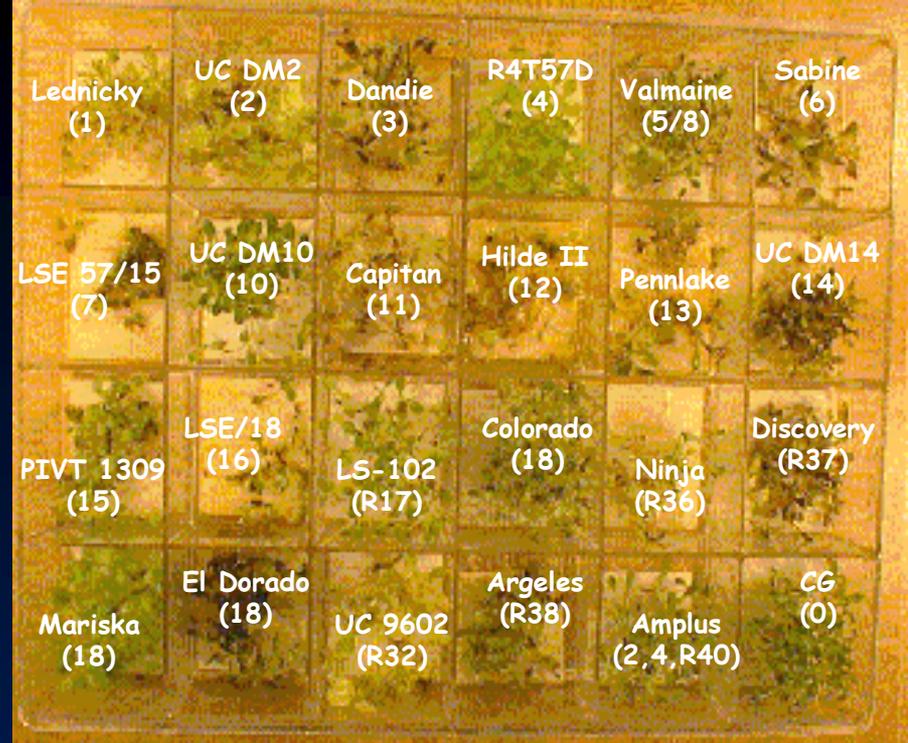




# Downy mildews of vegetables

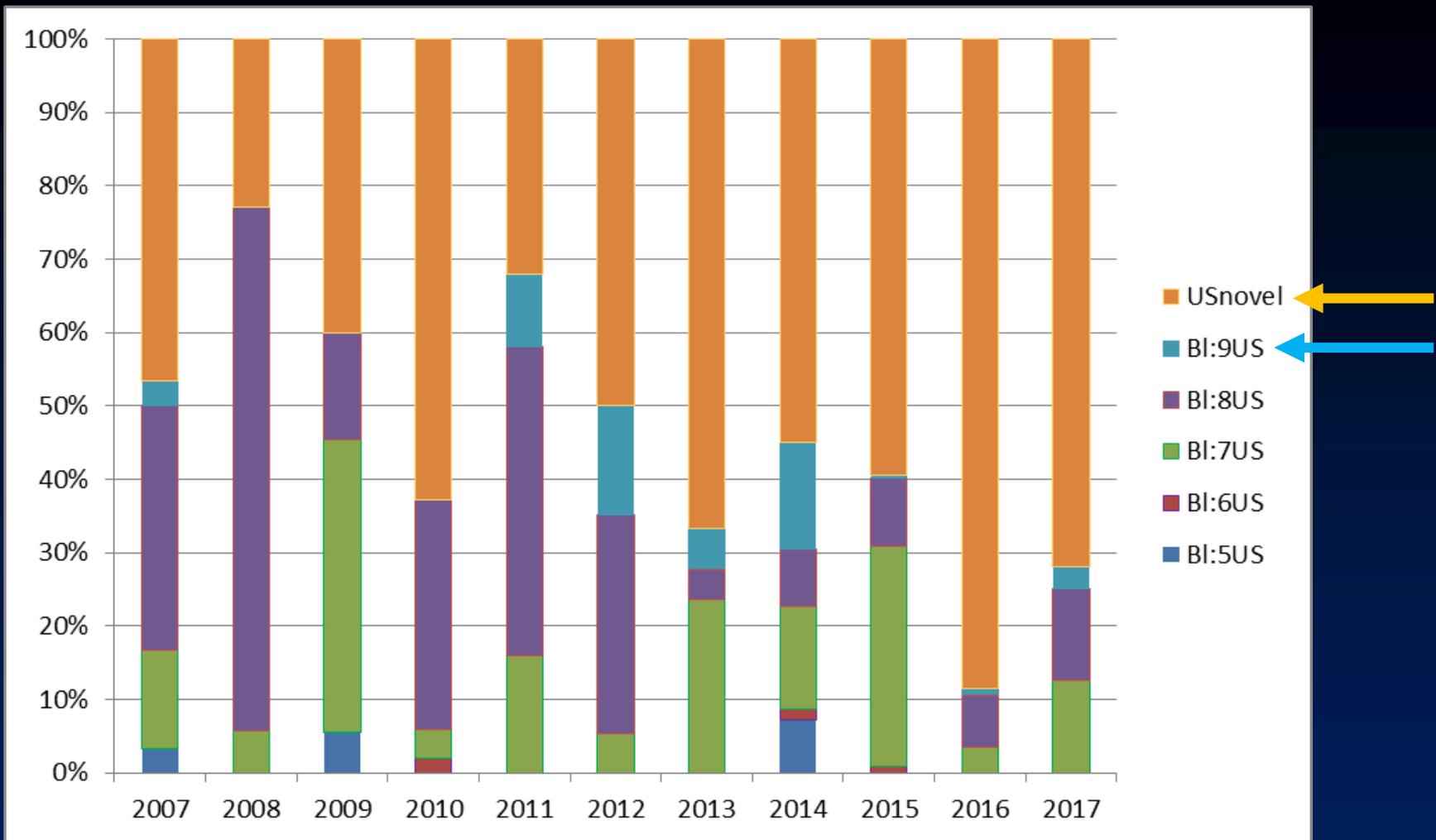
- Arugula
- Beet
- Broccoli
- Brussels sprouts
- Cabbage
- Cauliflower
- Cucumber
- Lettuce
- Mustards
- Onion
- Pea
- Radish
- Rappini
- Spinach
- Squash
- Swiss chard





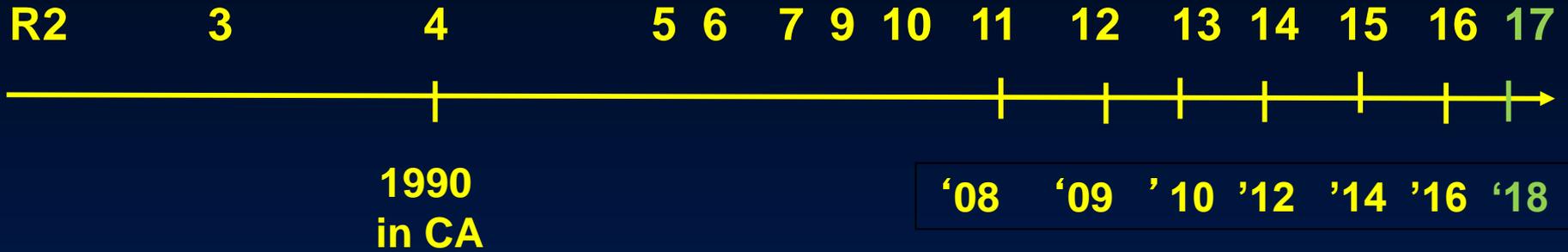
**Susceptible  
reaction**

**Lettuce differential  
cultivars for determining  
downy mildew pathotypes**

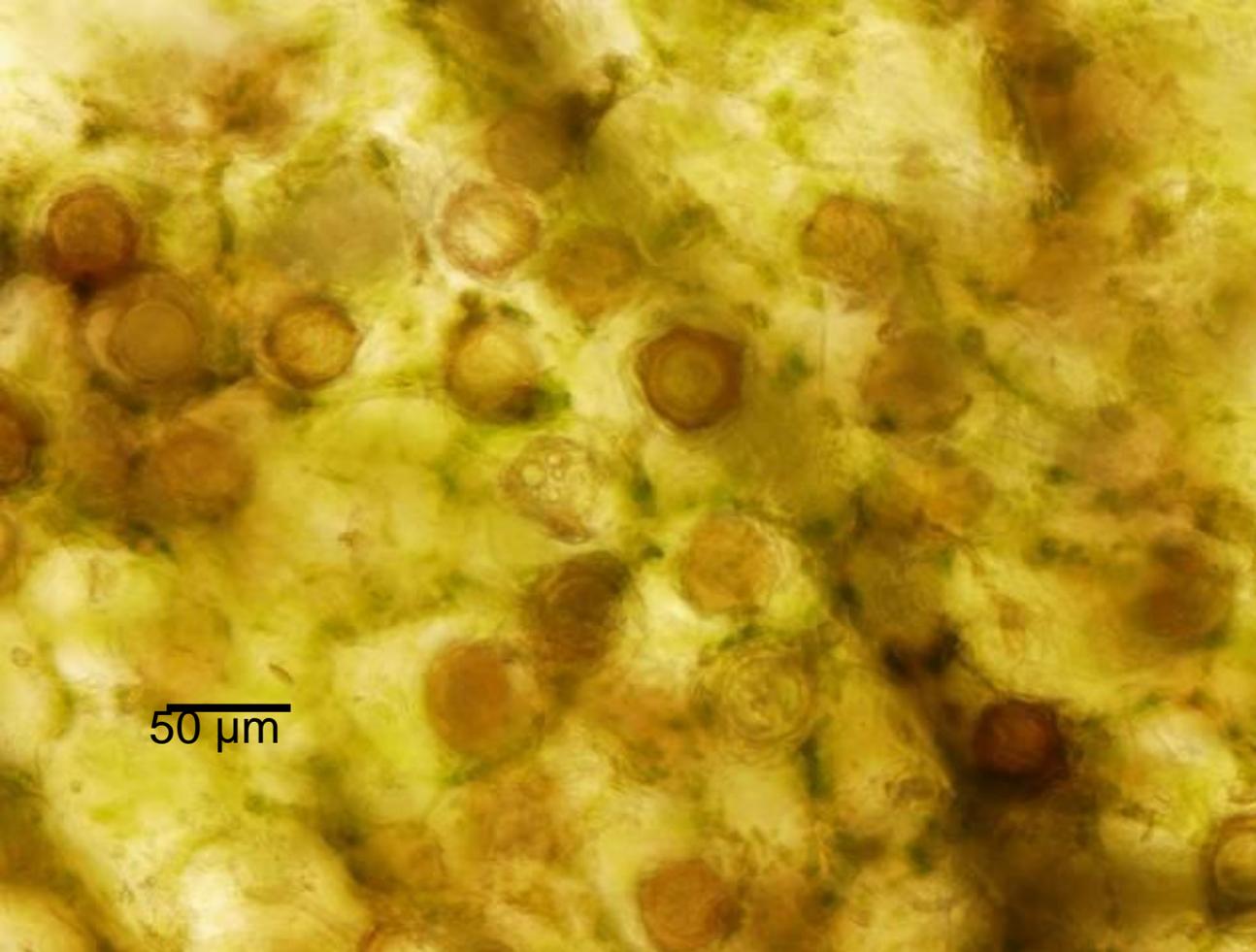


**Lettuce downy mildew: Frequency of CA pathotypes of *Bremia lactucae* (C. Tsuchida)**

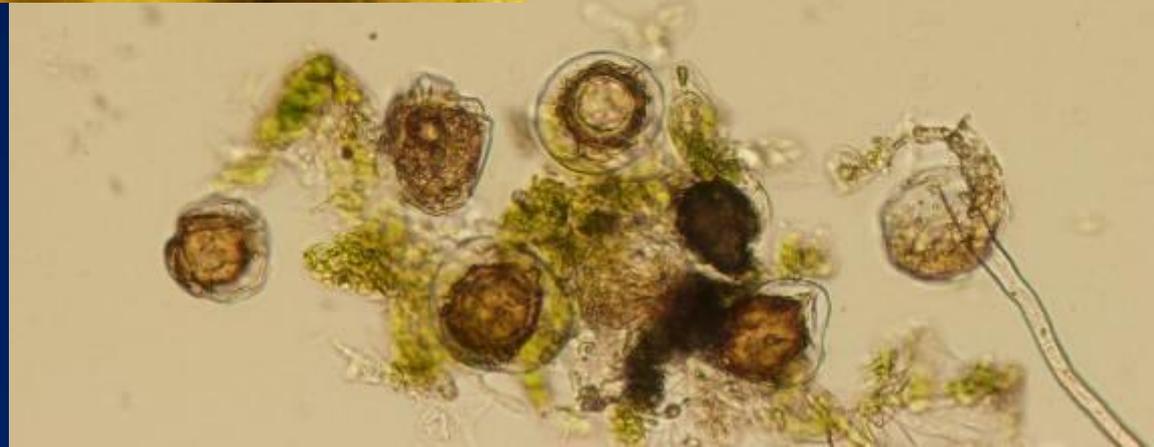
# Spinach downy mildew (*Peronospora effusa*):



# Spinach DM: oospores on seed

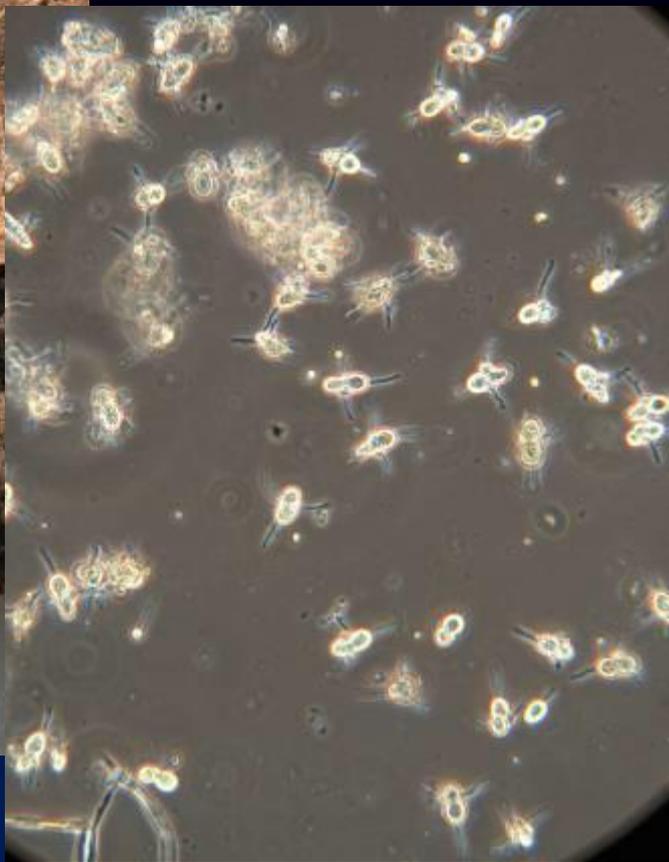


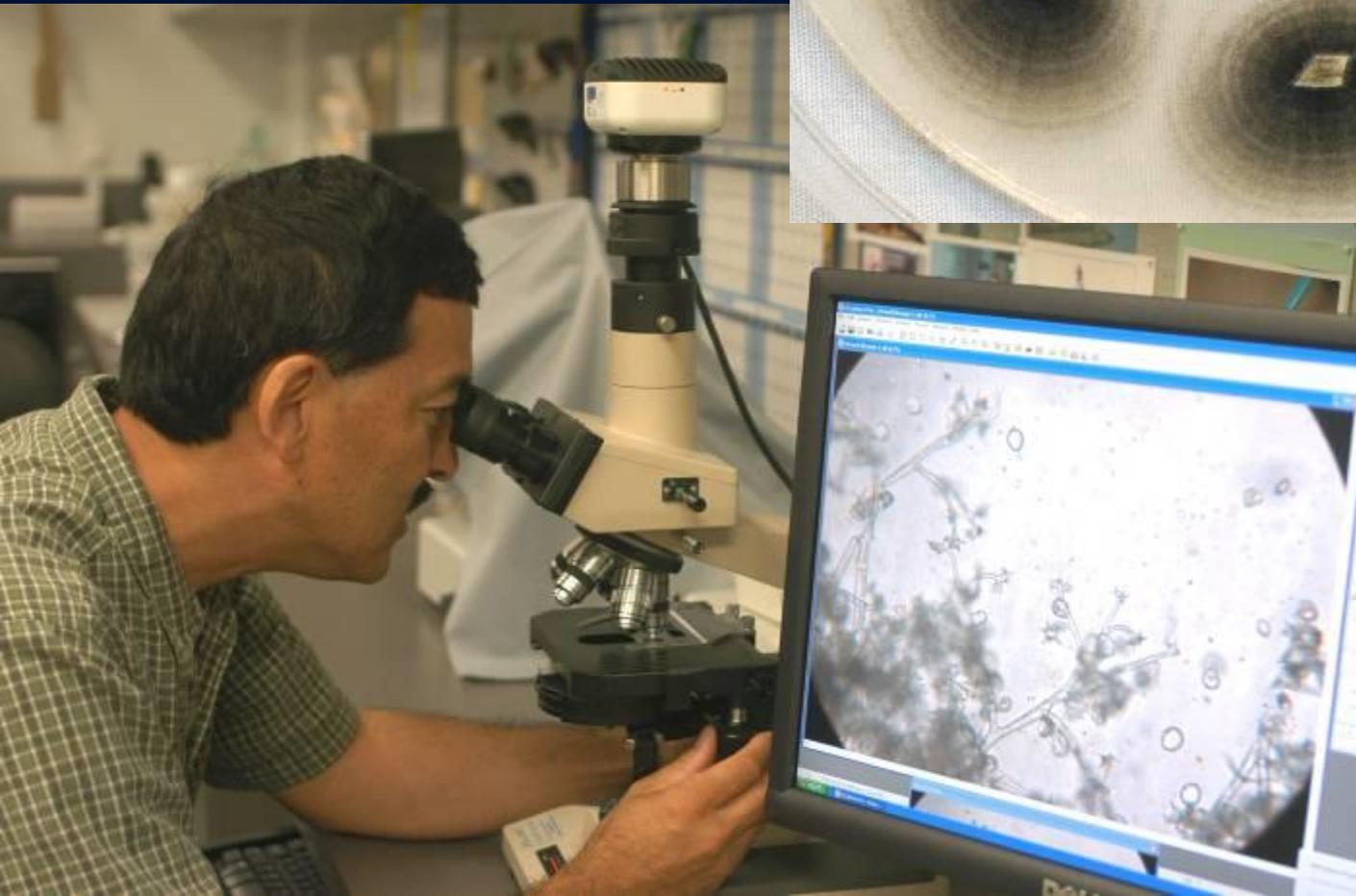
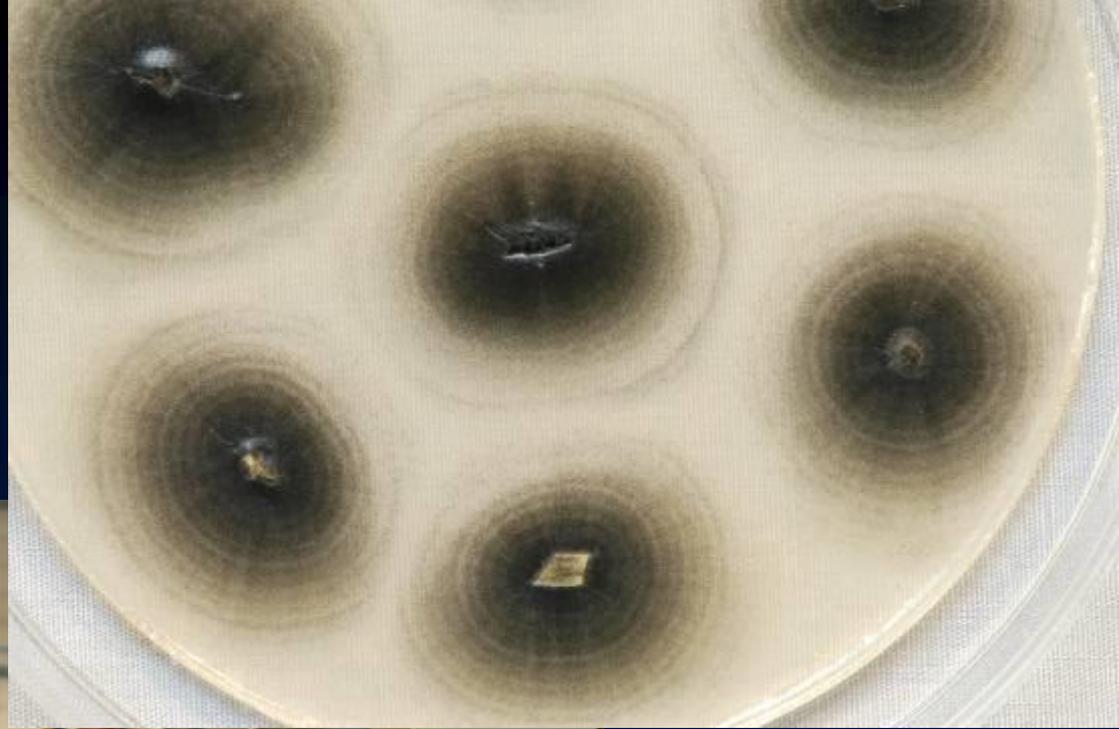
50 μm

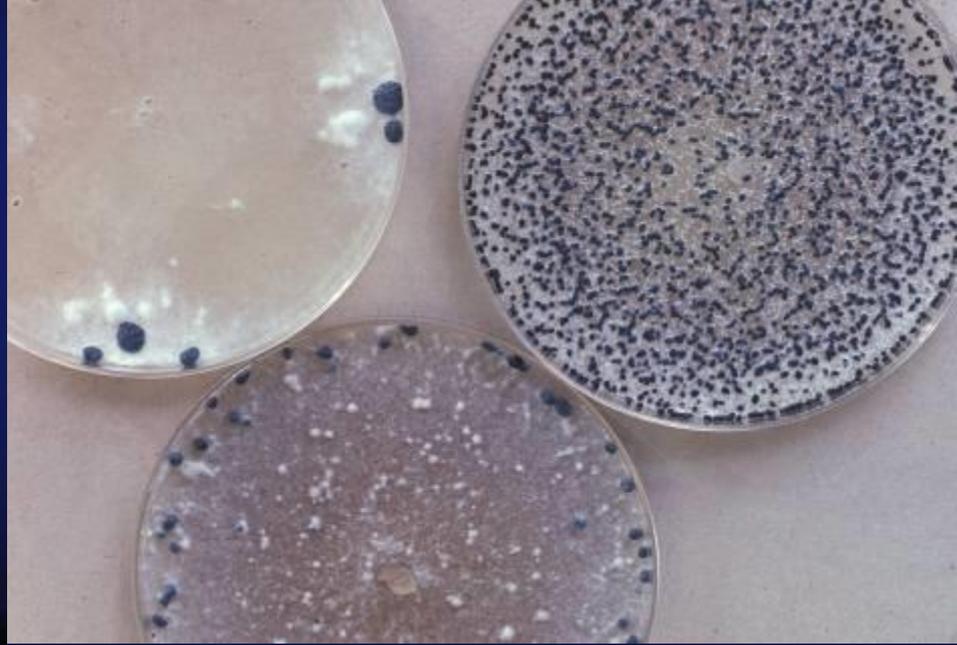
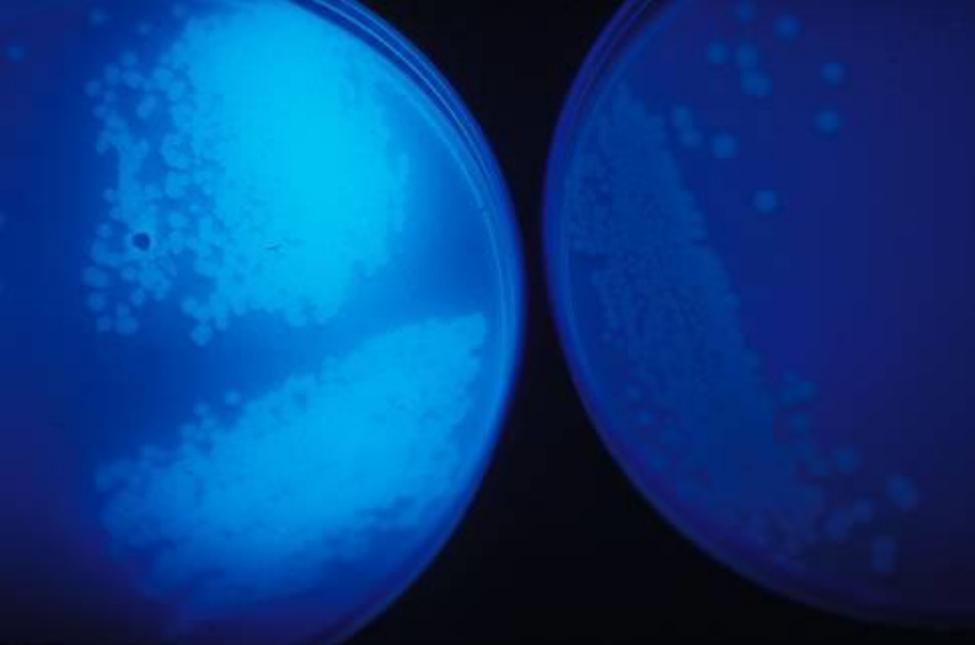


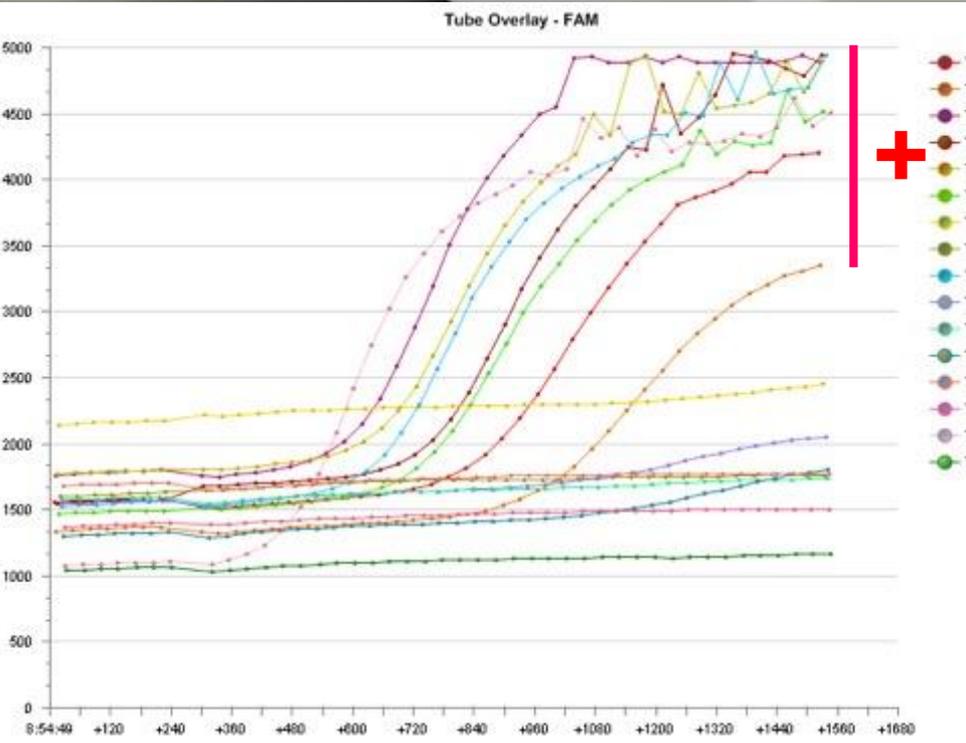
Photos: S. Klosterman













## **Industry and UC Labor issues:**

**High costs, availability**

## **Solutions:**

**Mechanization, automation**



# New plant pathology Farm Advisor

