

# Fusarium Diseases of Tomato

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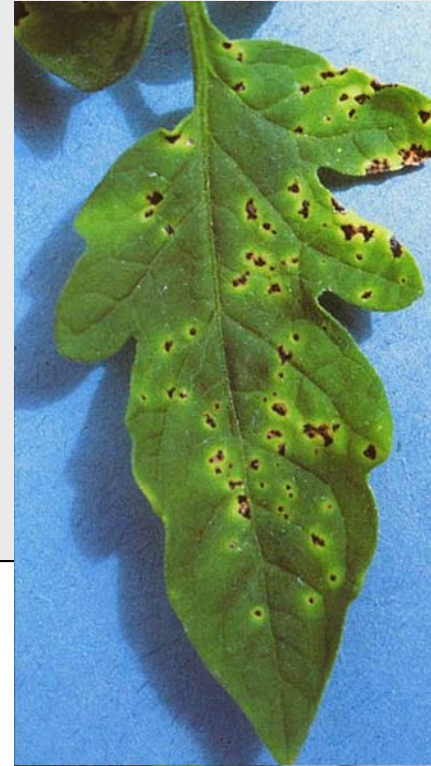
## Speck- *Pseudomonas syringae* pv. *tomato*

1996- 16 isolates race 0  
7 isolates race 1

2010- 15 isolates race 1

2010, 21 isolates tested for copper resistance  
(0, 0.2, 0.4, 1.2, and 2mM copper sulfate)

- All isolates grew on 0 or 0.2mM agar
- 14 isolates grew on 0.4mM agar – moderate resistance
- None grew on 1.2 or 2mM agar – no high levels of resistance



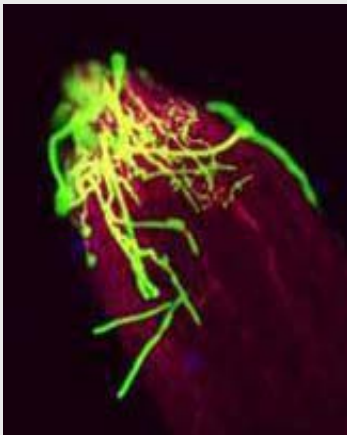
## *Verticillium dahliae*

- Cross pathogenic
  - Many crops
  - Non-domesticated plants
- Seedborne

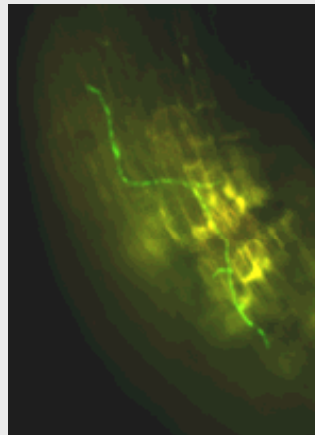
Two races in tomato:

Race 1: resistance available

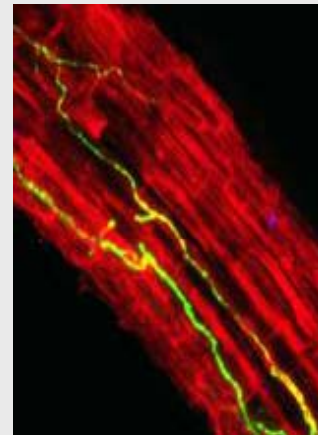
Race 2: no resistance available



Colonization  
of lateral root  
tip



Colonization of  
root elongation  
zone



Systemic  
colonization  
of lateral root

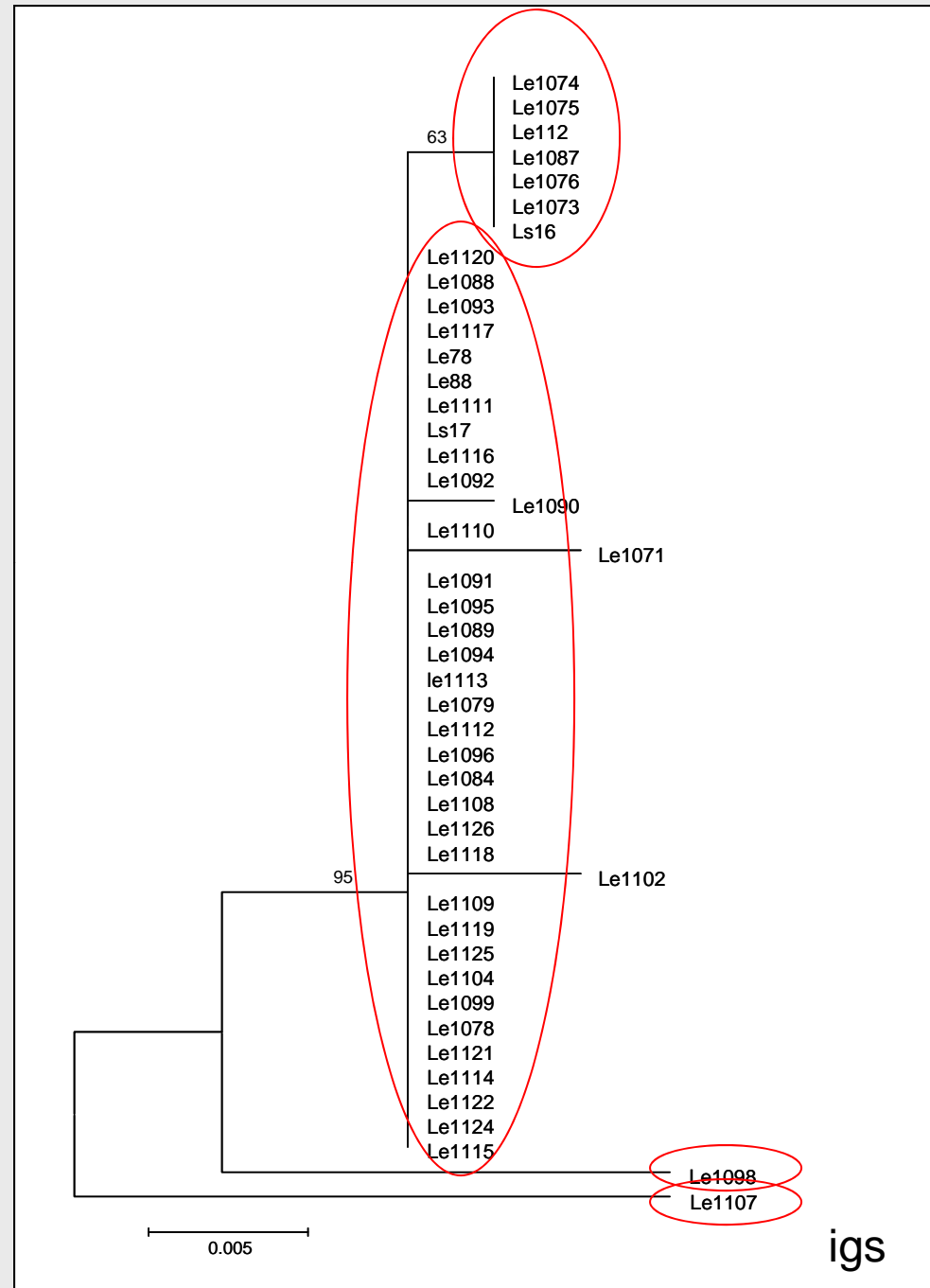


Mature microsclerotia  
embedded in taproot  
tissues

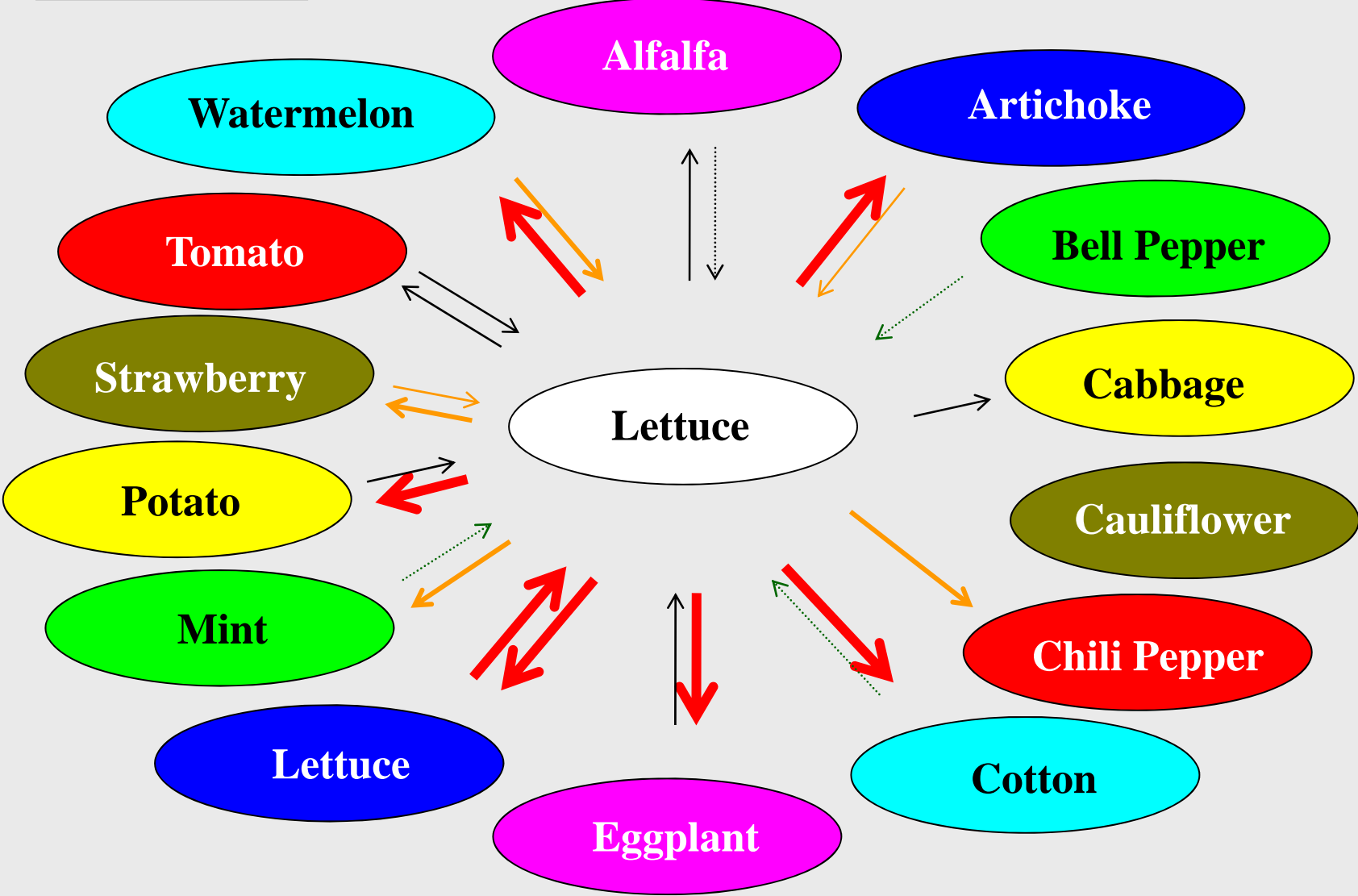
- Resistance by *Ve* gene (actually two closely linked genes *Ve1* and *Ve2*) first identified in 1951

- Race 2 capable of breaking *Ve* resistance

How diverse is race 2 ?  
Endemic or exotic?

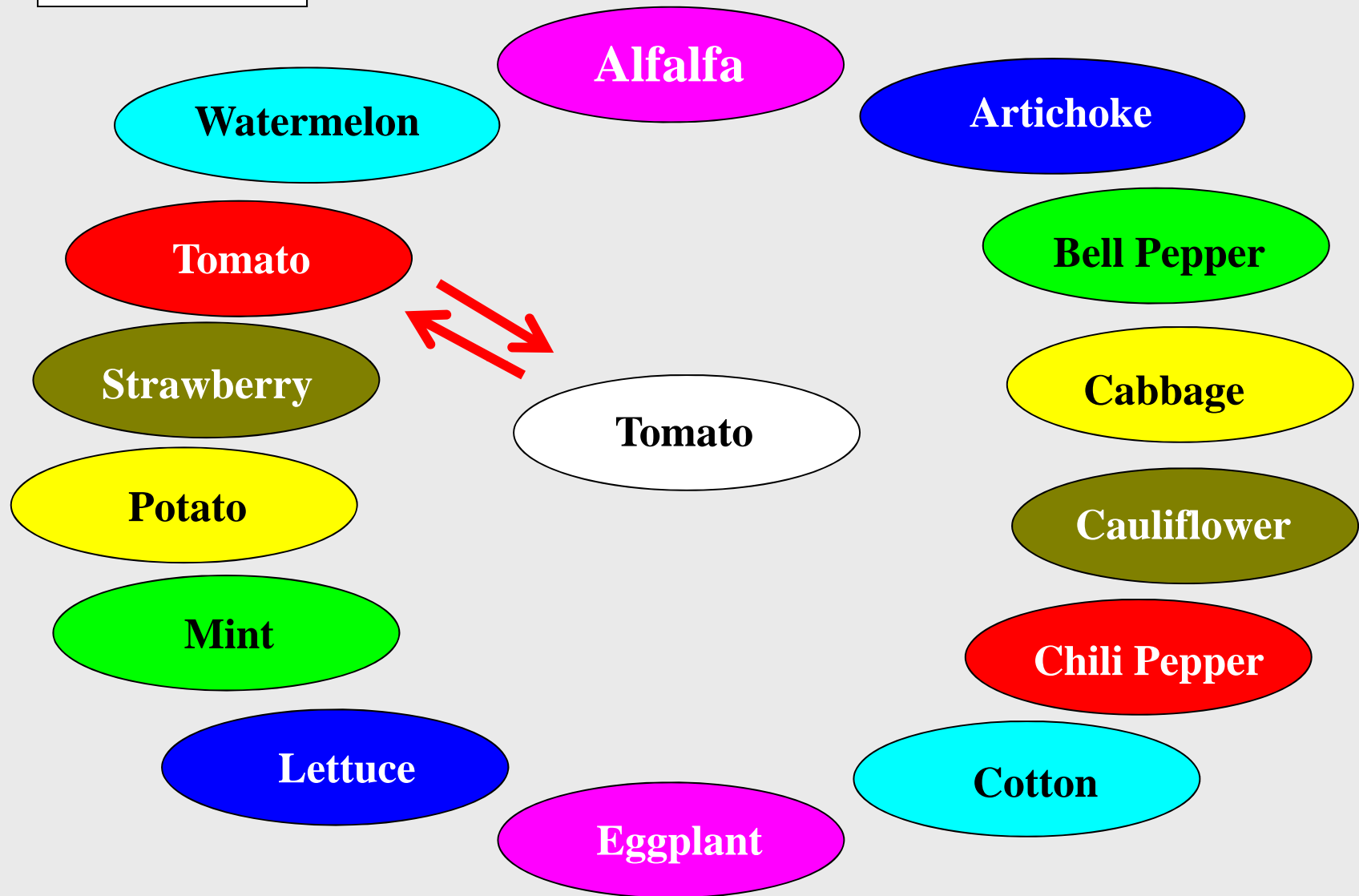


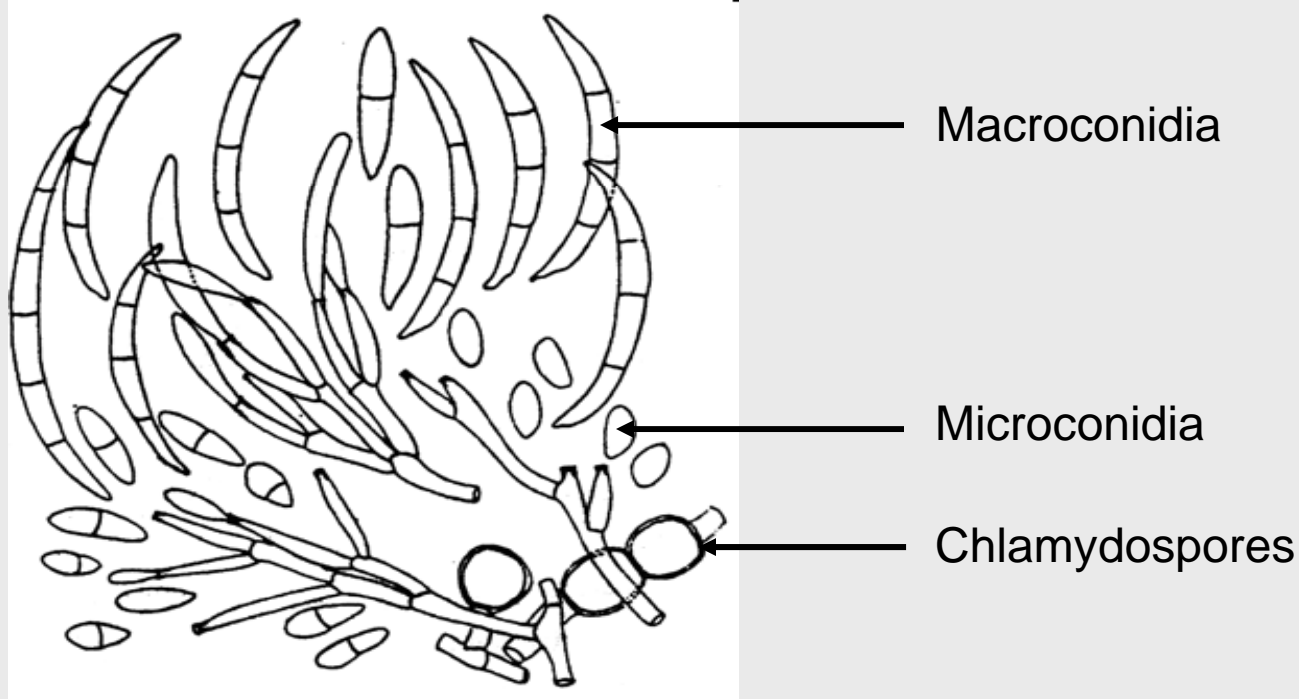
Verticillium





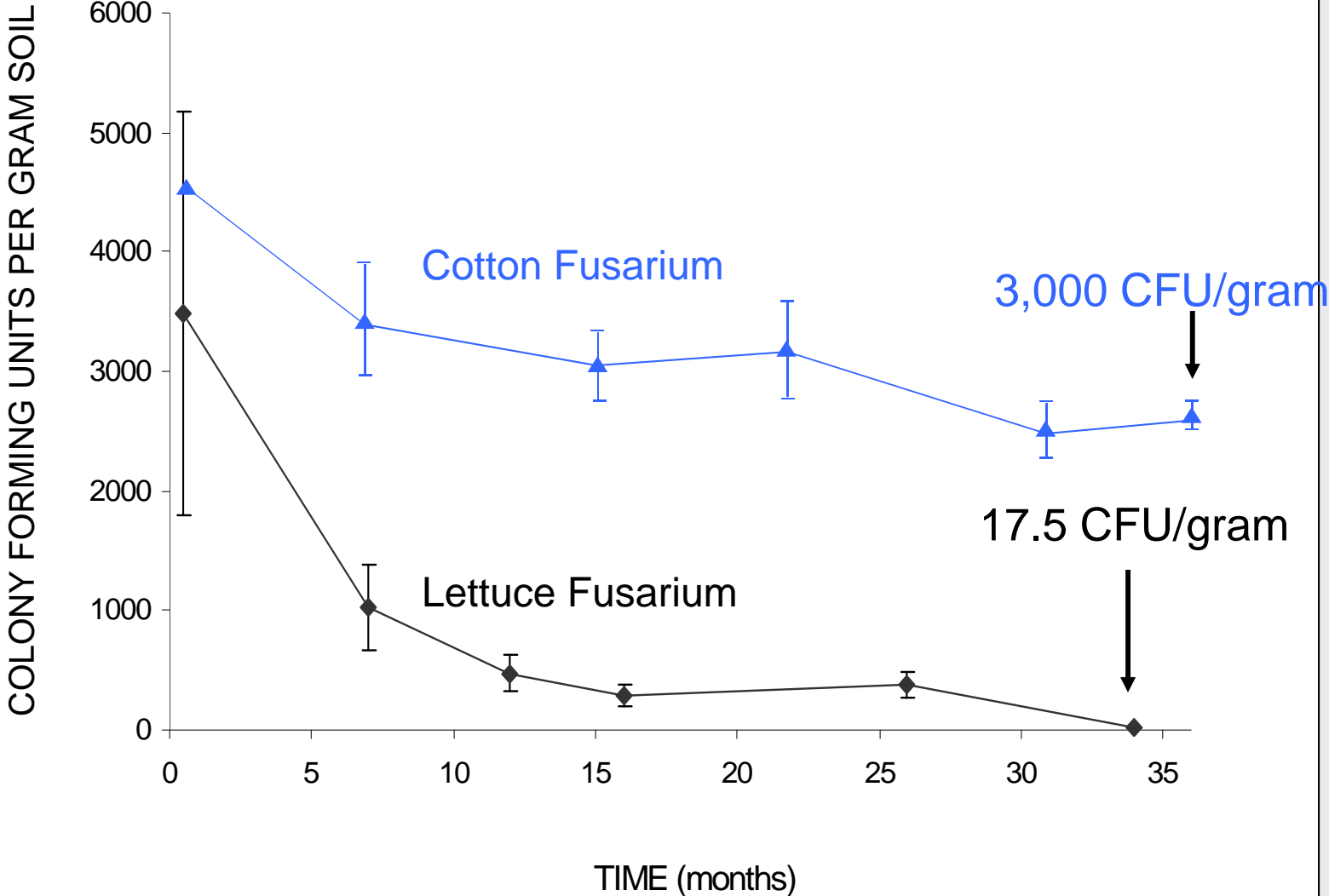
Fusarium





- *Fusarium oxysporum* form species are host specific
- Millions of spores are produced in each infected plant
- Because Fo retains its saprophytic ability, it remains in soil indefinitely, sustaining itself on other crops and weeds (without causing disease)

# Survival of Fusarium in field soil





## Fusarium Crown and Root Rot

*Fusarium oxysporum* f. sp. *radicis-lycopersici*

Hosts: some legumes, cucurbits, other solanaceous plants, and more









## Fusarium Foot Rot

*Fusarium solani* f. sp. *eumartii*

Hosts: Tomato, potato, eggplant









## Fusarium Wilt

*Fusarium oxysporum* f. sp. *lycopersici*

3 races, 1, 2, and 3





Tomato: 120,000 cfu/g dry stem tissue  
Cotton: 300,000 cfu/g fresh stem tissue

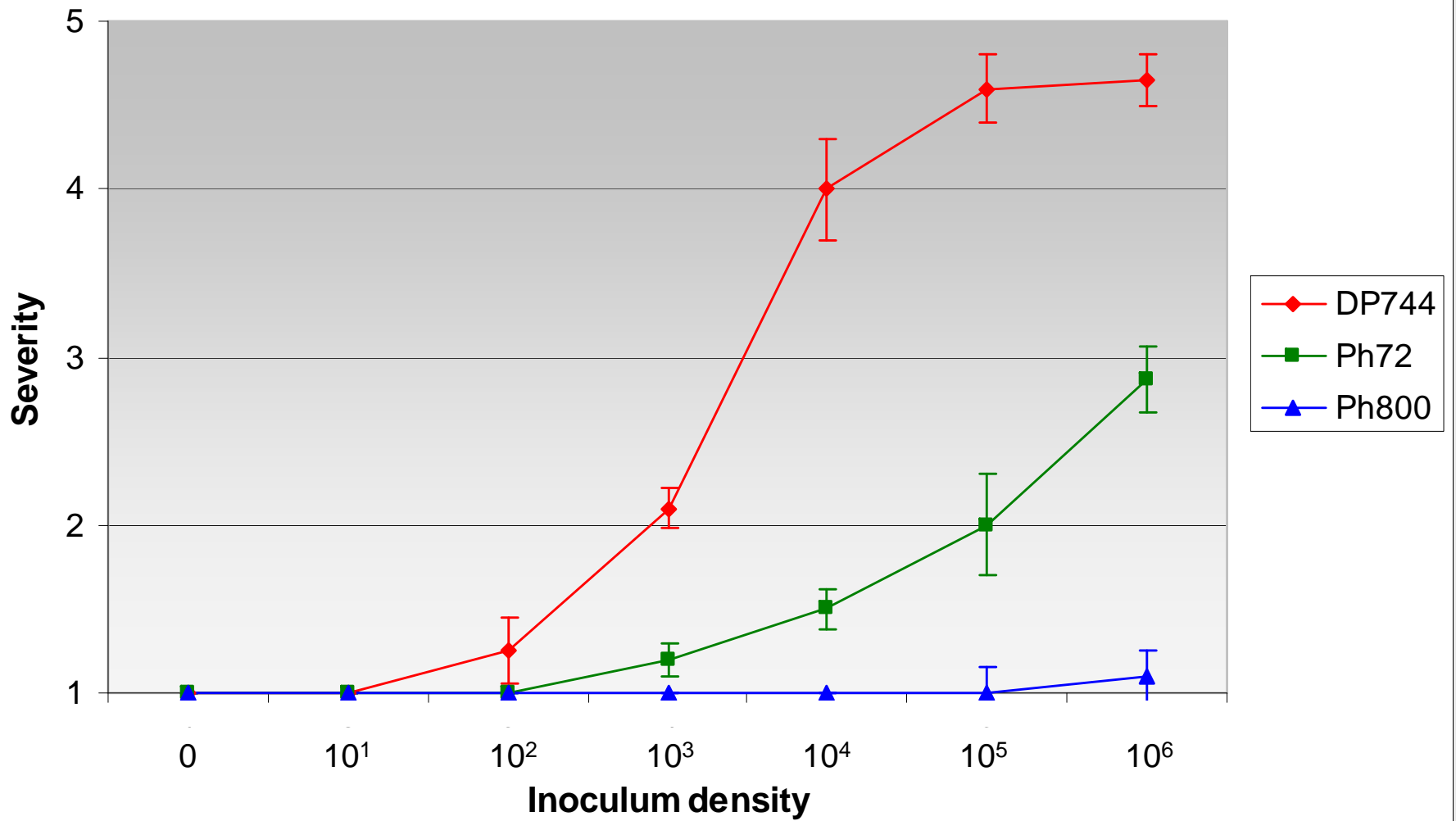


Verticillium





# Symptoms



## Movement

- Seed
- Any way soil is moved

## Management

- Containment
- Clean seed
- Soil fumigation
- Rotation
- Resistance