

Fusarium Diseases of Tomato

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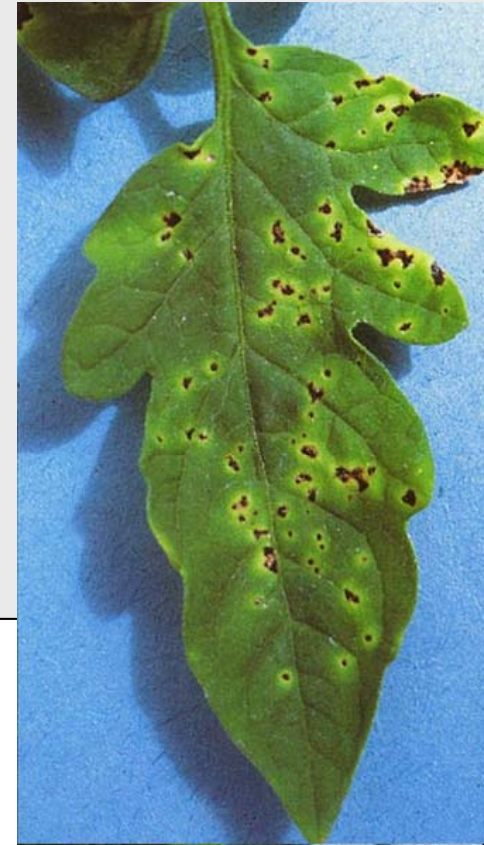
UC Davis



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

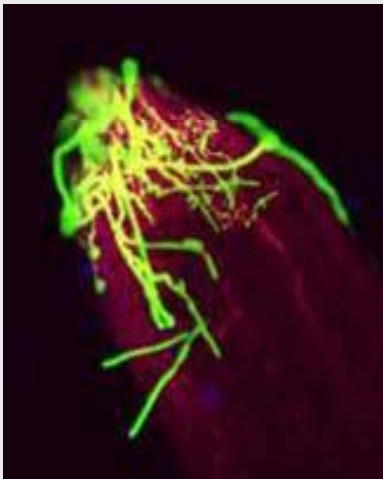
Verticillium dahliae

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

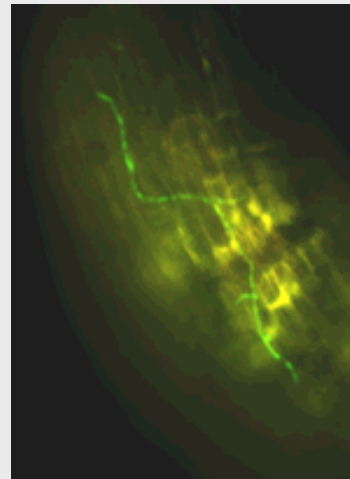
Two races in tomato:

Race 1: resistance available

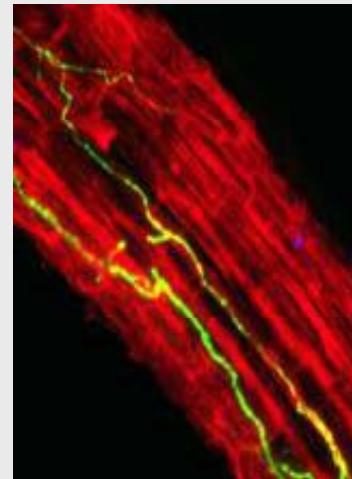
Race 2: no resistance available



Colonization
of lateral root
tip



Colonization of
root elongation
zone



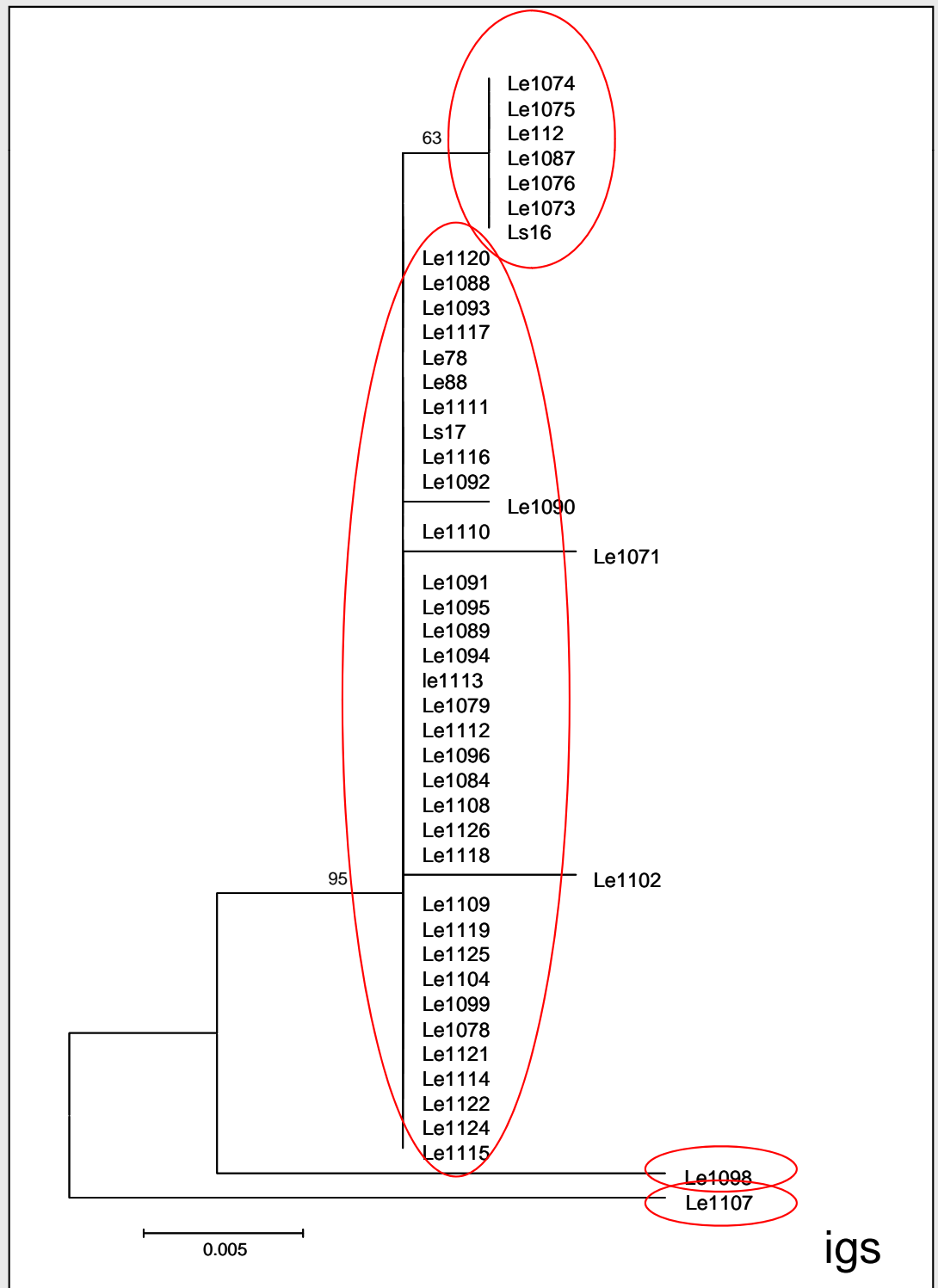
Systemic
colonization
of lateral root



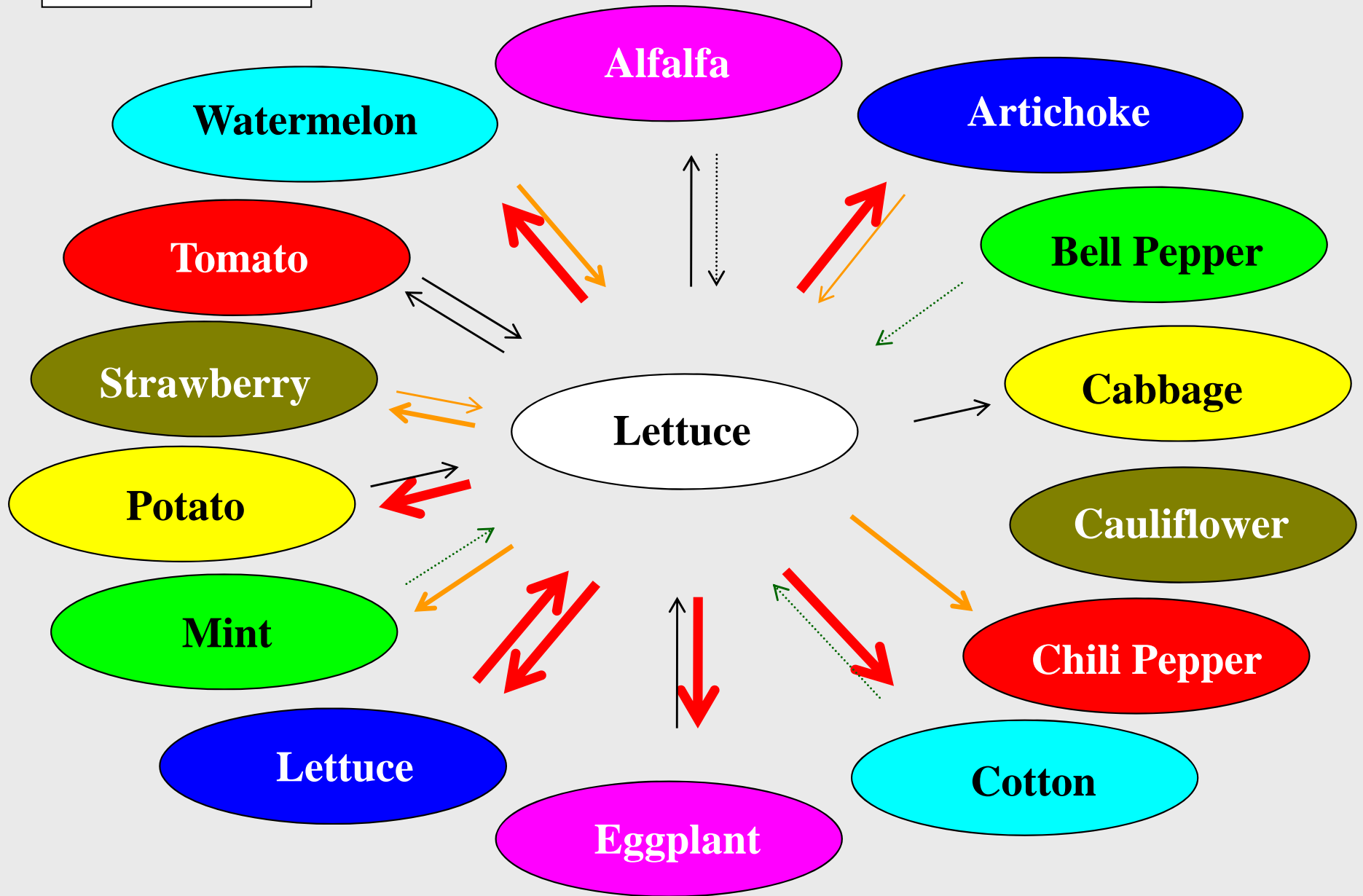
Mature microsclerotia
embedded in taproot
tissues

- Resistance by *Ve* gene (actually two closely linked genes *Ve1* and *Ve2*) first identified in 1951
- Race 2 capable of breaking *Ve* resistance

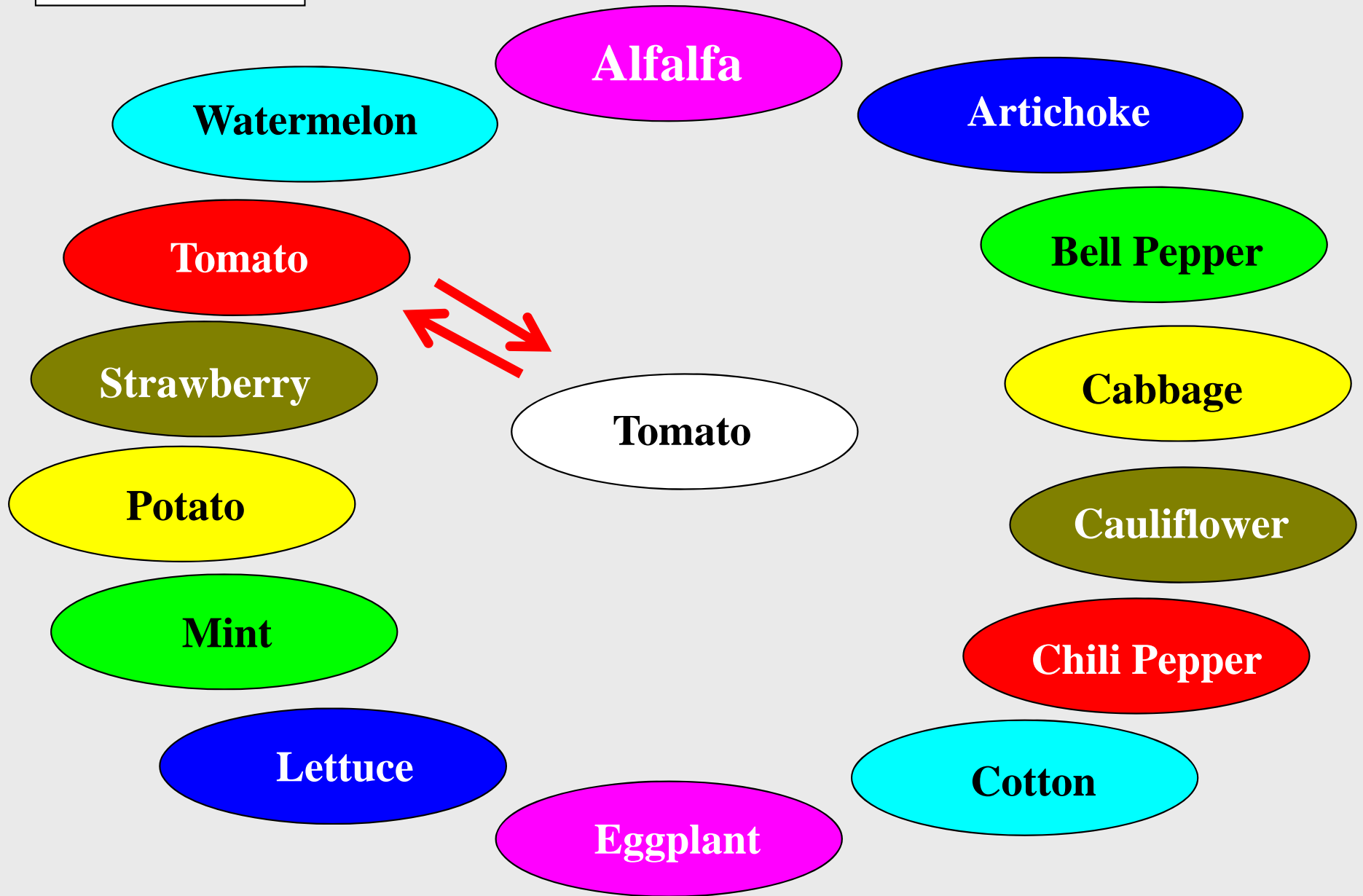
How diverse is race 2 ?
Endemic or exotic?

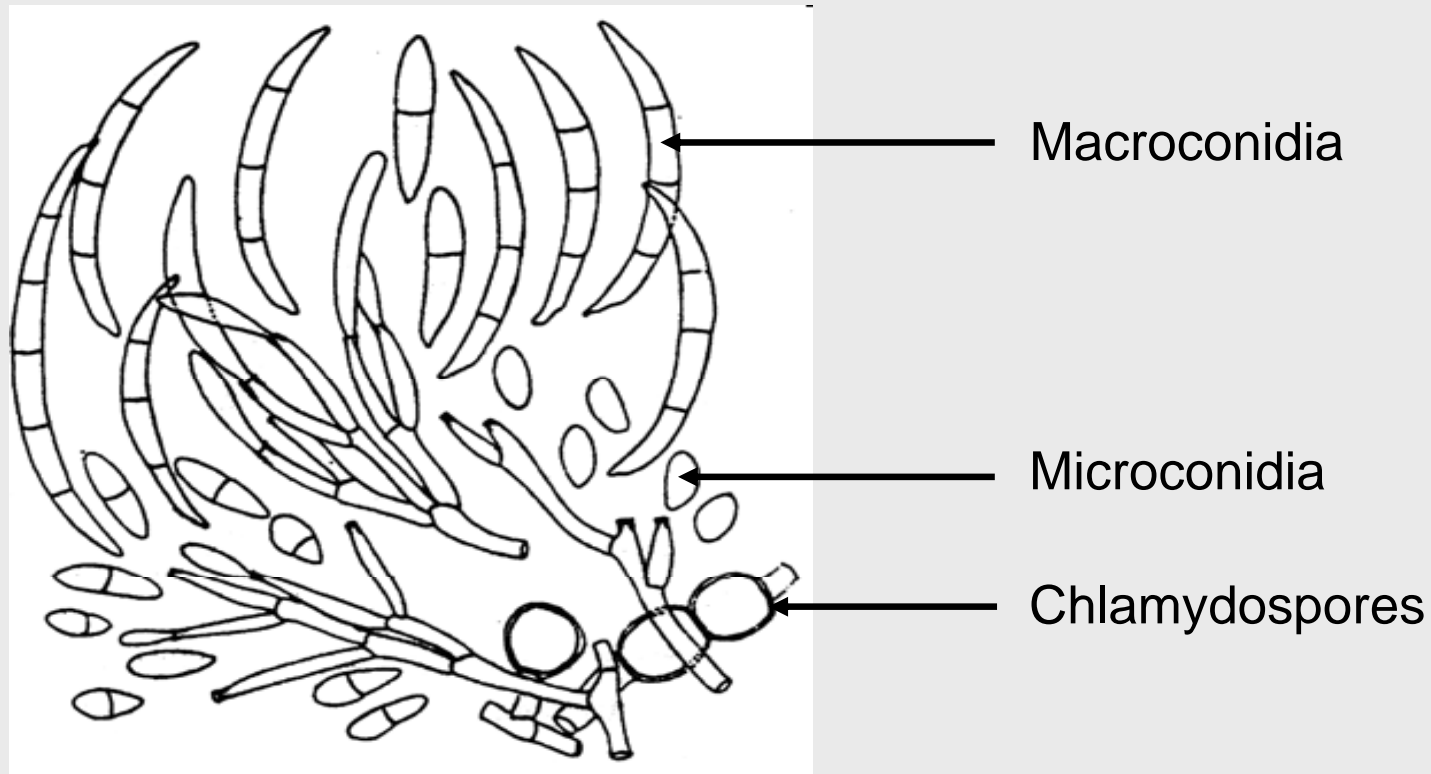


Verticillium



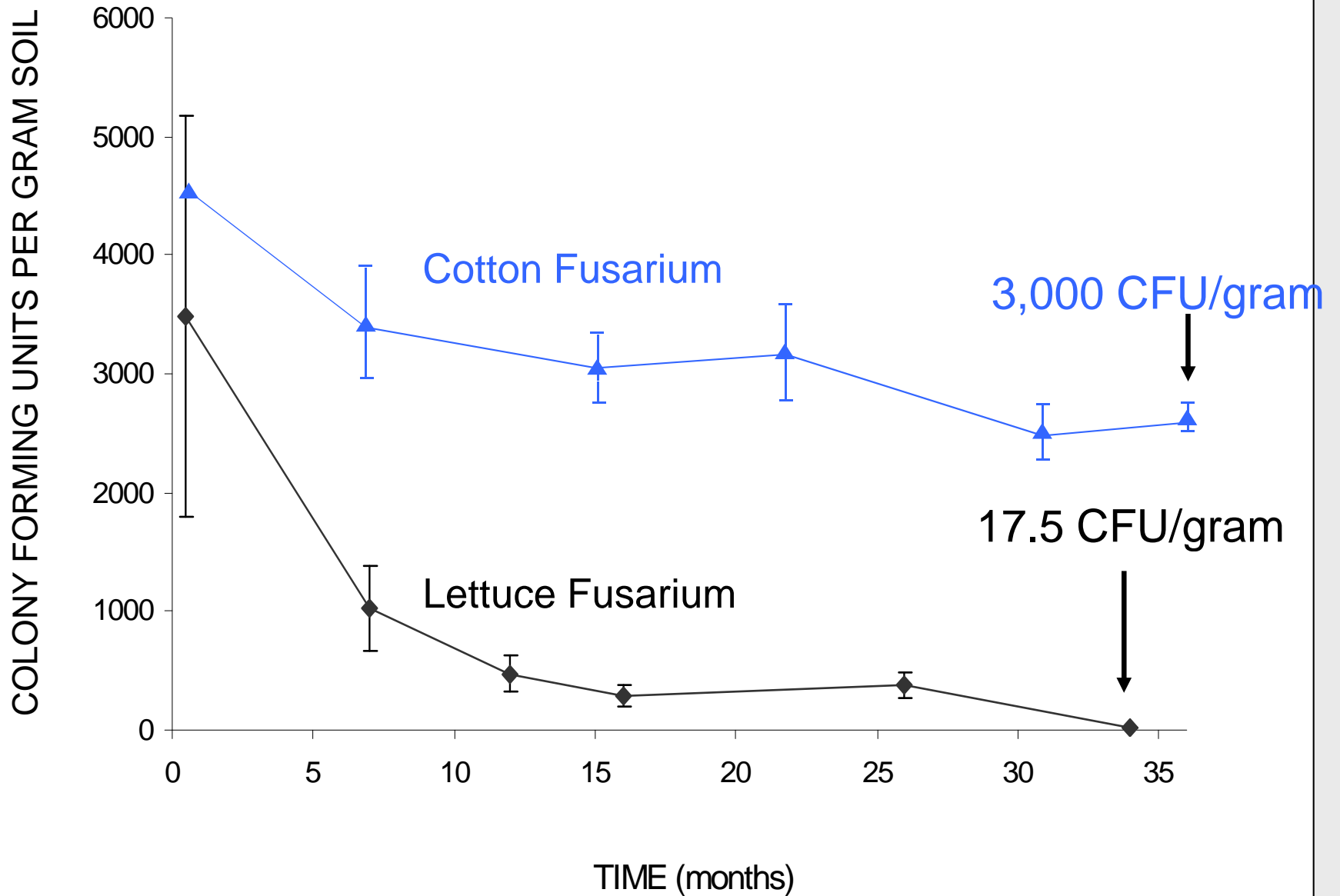
Fusarium





- *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



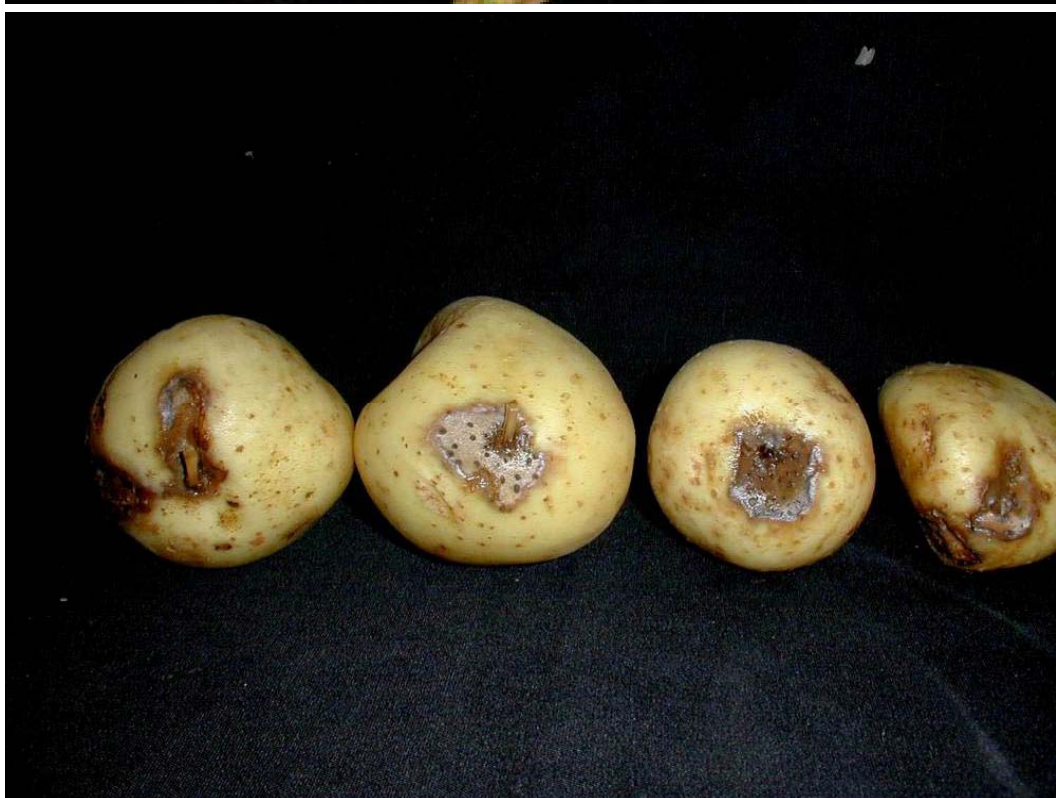


Fusarium Foot Rot

Fusarium solani f. sp. *eumartii*

Hosts: Tomato, potato, eggplant





Fusarium Wilt

Fusarium oxysporum f. sp. *lycopersici*

3 races, 1, 2, and 3



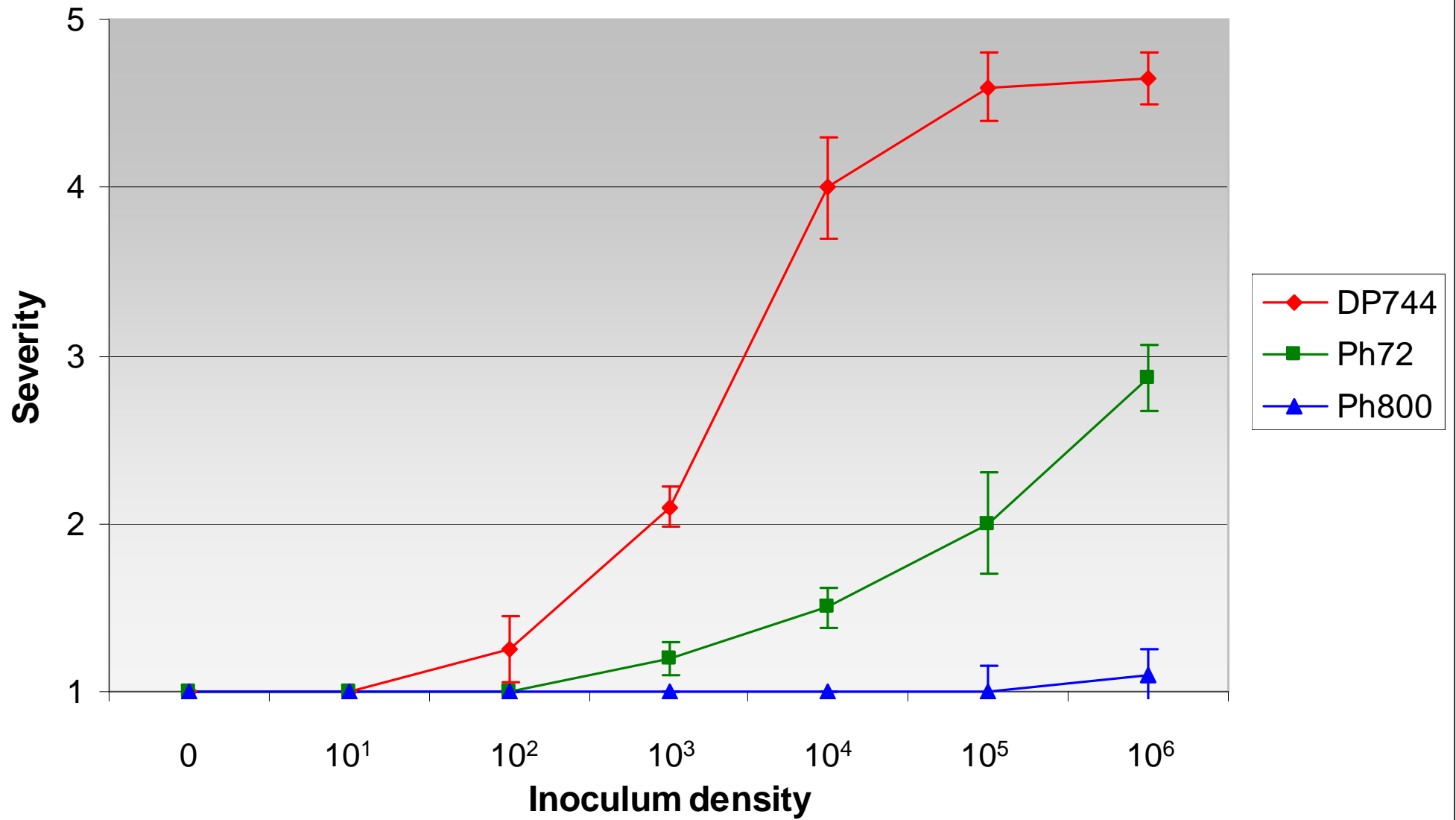
Tomato: 120,000 cfu/g dry stem tissue
Cotton: 300,000 cfu/g fresh stem tissue



Verticillium



Symptoms



Movement

- Seed
- Any way soil is moved

Management

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