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 2 mM copper sulfate)

- All isolates grew on 0 or 0.2 mM agar
- 14 isolates grew on 0.4 mM agar – moderate resistance
- None grew on 1.2 or 2 mM 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
• 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

Watermelon

Alfalfa

Artichoke

Tomato

Bell Pepper

Strawberry

Cabbage

Potato

Cauliflower

Mint

Chili Pepper

Lettuce

Cotton

Eggplant
• *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

**Cotton Fusarium**
- 3,000 CFU/gram

**Lettuce Fusarium**
- 17.5 CFU/gram
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

Inoculum density

Severity

DP744
Ph72
Ph800

0 10^1 10^2 10^3 10^4 10^5 10^6
Movement

• Seed
• Any way soil is moved

Management

• Containment
• Clean seed
• Soil fumigation
• Rotation
• Resistance