Pepper Diseases: Concerns and Management

Steven Koike
TriCal Diagnostics
Powdery mildew: Oidiopsis
Management: Powdery mildew

- Resistant cultivars:
  - Some *Capsium annuum* R lines exist
  - Not suitable for CA production?

- Disease more severe w/ high humidity.

- Overhead sprinkler irrigation reduces severity, but increases other problems.

- Monitor adjacent host crops (tomato).

- Apply fungicides.
Bacterial spot: Xanthomonas
Fungicides

- Sulfur: effective, many regular apps.
- Cabrio, Flint, Fontelis, Luna, Quadris, Quintec, Rally

- Organic: sulfur, K bicarbonate, oils, K phosphate, plant extracts, neem seed extract, biological control agents (AQ 10)?
# Fungicide trial: Pepper powdery mildew

<table>
<thead>
<tr>
<th>Treatment</th>
<th>PM severity</th>
</tr>
</thead>
<tbody>
<tr>
<td>Luna Sensation 7.6 fl oz</td>
<td>1.38</td>
</tr>
<tr>
<td>*Luna Privilege 6.8 fl oz</td>
<td>1.68</td>
</tr>
<tr>
<td>Cabrio 8 oz</td>
<td>1.98</td>
</tr>
<tr>
<td>Actinovate 2.4 lb</td>
<td>5.21</td>
</tr>
<tr>
<td>Untreated</td>
<td>5.53</td>
</tr>
</tbody>
</table>

LSD (*P* = 0.05) 0.53

1 = no pm; 6 = 76 to 100% leaf surface w/ pm

*Not registered in CA
Control
Luna Sensation
Soilborne diseases of pepper

• Verticillium wilt
  – *Verticillium dahliae*
• Fusarium wilt
  – *Fusarium oxysporum*
• Phytophthora root and crown rot
  – *Phytophthora capsici*
• White mold
  – *Sclerotinia sclerotiorum*
• Southern blight
  – *Sclerotium rolfsii*
Soilborne disease symptoms

• Symptoms common to all pathogens:
  – Stunting
  – Poor growth
  – Chlorosis
  – Wilting
  – Dieback
  – Collapse
  – Plant death
Soilborne disease: Quick field assessment

- See mycelium or sclerotia?
  - Southern blight or White mold
- See internal, vascular discoloration?
  - Verticillium wilt or Fusarium wilt
- See rotted roots?
  - Phytophthora root and crown rot
<table>
<thead>
<tr>
<th>Symptoms</th>
<th>Verticillium</th>
<th>Fusarium</th>
<th>Phytophthora</th>
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<tbody>
<tr>
<td>Small, stunted plants</td>
<td>yes</td>
<td>yes</td>
<td>yes</td>
<td>yes</td>
<td>yes</td>
</tr>
<tr>
<td>Wilted leaves</td>
<td>yes</td>
<td>yes</td>
<td>yes</td>
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<tr>
<td>Yellowed leaves</td>
<td>yes</td>
<td>yes</td>
<td>yes</td>
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<tr>
<td>Collapsed plants</td>
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<td>Decayed crowns</td>
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<td>no</td>
<td>yes</td>
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<tr>
<td>Vascular discolor</td>
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<td>no</td>
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<tr>
<td>Rotted roots</td>
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<td>no</td>
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<tr>
<td>White mycelium</td>
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<tr>
<td>Sclerotia on crown</td>
<td>no</td>
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Irr., black round, brn
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irr., black round, brn
Phytophthora
Sclerotium rolfsii
Management: Soilborne diseases

- Crop rotation
- Avoid planting pepper in infested fields
- Fumigation
- Resistant varieties?
- Sanitation: avoid spreading the pathogen
Virus pathogens of pepper

• Difficult to diagnose:
  – Symptoms overlap
  – Multiple virus infections

• Main factors for control:
  – Account for virus reservoir
    • Weeds
    • Nearby host crops
  – Vector management
  – Resistant cultivars (TSWV)
Common pepper viruses and vectors

- Tomato spotted wilt: thrips
- Impatiens necrotic spot: thrips
- Cucumber mosaic: aphid
- Pepper mottle: aphid
- Potato virus Y: aphid
- Tobacco etch: aphid
- Alfalfa mosaic: aphid
- Beet curly top: leafhopper
- Pepper mild mottle: seed, mechanical
- Tobacco/tomato mosaic: seed, mech.
Cucumber mosaic virus
Beet curly top virus
Tomato resistant to TSWV (Sw-5)

Resistance breaking strain of TSWV

RB-TSWV
In Central Valley
On tom, cel, lettuce

Diseased tomato
Synthetic insecticides for thrips

- acephate
- abamectin
- chlorpyrifos
- cyhalothrin-λ
- cypermethrin
- diazinon
- dimethoate

- endosulfan
- methiocarb
- methomyl
- methyl parathion
- permethrin
- spinetoram
- spinosad
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* Resistance reported