Cucumber disease control

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Agenda

- Symptom recognition
- Where the disease come from
- Disease Management
- Check list
Disease control is same for all cucumbers
Downy Mildew

Advanced (Necrotic)
Downy Mildew

Black sporulation on lower surface
Downy Mildew

Lower surface 40X
Black spores

Laboratory: Spores at 100X
Cucumber is more susceptible than other cucurbits

All 5 races attack cucumber
Downy mildew development

- Spores come by air from other cucurbits
- Spores germinate on wet leaves
- Disease develop in cool, moist conditions
How downy mildew arrives at your farm
Forecasting

- Cool moist conditions at the source
- Wind direction, Cloudy days
- Chances of rain
- Cool conditions at the farm
Downy mildew
Fungicide program

- Week 1: Presidio + Manzate
- Week 2: Previcure + Bravo
Powdery mildew
Powdery mildew – Advanced stage

Red Fruiting bodies
Powdery mildew

Facts

- 2 races
- Air-borne spores
- Dry conditions favor infection
Powdery mildew control

- Fungicides - 7-10 day intervals (Rally, Topsin M)
- Biocontrol
- Resistant varieties
Gummy stem blight
Gummy ooze

Black dots - Pycnidia

Gummy stem blight
Gummy stem blight
How does it get to your farm

- Infected seed
- Spores from debris
- Spores from other cucurbits

Disease develops in 7 days (low light & cool climate (<23C))
Gummy stem blight
Spread within your farm

- Asexual spores (Water splashes)
- Sexual spores (air currents in the evening)
- Tools
Gummy stem blight control

- Sanitation
- Increase air flow
- Reduce root pressure (prune 1-2 leaves only at a time)
- Fungicides .. Rovral
Anthracnose

Cracking lesions
Anthracnose fruiting bodies

Black setae are diagnostic
Anthracnose facts

- Seed borne
- Above ground parts infected
- Spore splashes cause secondary spread
- Resistant varieties – good method
- Fungicides on sensitive varieties
Angular leaf spot (Bacterial)
Angular leaf spot control

- Seed borne – get tested seed
- Copper sprays (if safe)
- General sanitation practices
Botrytis gray mold
Botrytis

- Air borne
- Cool (<60F) and high RH
- Prune lower leaves for air circulation
- Prune close to stem
- Sanitize wounds
Pythium
How does this get to your Farm

- Stream water, Pond water
- Plug transplants
- Soil, debris, growing media
- Fungus gnats, shore flies
Pythium
Spread within farm

- Water mold (spreads in water)
- Infection increase if there is stress (over watering, temperature extremes)

Zoospores swim in water
Pythium Control

- Avoid wet areas (Rockwool at 75% moisture)
- Treat water (Ozone, Chlorine)
- Fungus gnat control
- Non-continuous growing media
- Send sample to lab

Lab test is helpful in selecting a fungicide. A wrong fungicide can increase disease.
Phytophthora

- Water mold like Pythium
- Control measures same as for Pythium

Lab ID is required to differentiate water molds from other fungi for selecting fungicides
Fusarium stem and root rot

- Plants die at fruiting
- 20°C favors infection (No spread at 32°C)
- Spread - soil, water (not air)
- Seed?

F.o. radicis-cucumerinum
Fusarium Control

- Healthy transplants
- Cull pile far away (shore flies, Gnats)
- Flush drip lines (disinfectant)
- Bio-control (Mycostop, Rootshield)
Sudden decline (Monosporeascus)

- Sudden decline at fruiting (if sunny days follow after rain)

- Soil borne (not important in rockwool culture)
Other diseases
Fungal / bacterial

- Fungi
  - Verticillium wilt
  - Macrophomina Charcoal rot
  - Rhizoctonia

- Bacteria
  - Bacterial wilt (Erwinia)
  - Bacterial fruit blotch (?)
Viruses

Viruses do not kill plant but cause deformation (Mosaic, stunting, shoe string, mottle etc)

Many viruses can cause similar symptoms
Cucumber mosaic
Papaya ring spot virus
Zucchini yellow mosaic
Cucumber green mottle mosaic
Viruses
How they get to your farm

- Insects bring virus
- CMV infects many plant species and is seed borne in 19 species
## Viruses

<table>
<thead>
<tr>
<th>Virus</th>
<th>Vector</th>
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</thead>
<tbody>
<tr>
<td>Cucumber mosaic</td>
<td>Aphid</td>
</tr>
<tr>
<td>Zucchini yellow mosaic</td>
<td>Aphid</td>
</tr>
<tr>
<td>Papaya ring spot</td>
<td>Aphid</td>
</tr>
<tr>
<td>Watermelon mosaic</td>
<td>Aphid</td>
</tr>
<tr>
<td>Squash mosaic</td>
<td>Seed, Beetle</td>
</tr>
<tr>
<td>Cucumber green mottle mosaic</td>
<td>Seed</td>
</tr>
<tr>
<td>Cucumber vein yellowing</td>
<td>White fly</td>
</tr>
</tbody>
</table>
Zucchini yellow mosaic
Disease management
Disease

Virulent Pathogen

Susceptible Host

Favorable Environment
Double door for insect control

Serves as air-lock
Weed cloth 10ft around greenhouse
(For insect and disease control)
Reflective mulch around greenhouse
(to confuse insects)
Boot scrubber to reduce soil going into greenhouse
Foot bath to sterilize boots
Greenshield, Physan20
Hand wash station (near entry)

(Disease control during pruning, tying, harvesting etc)
Check for any holes in the screen
Debris removal at end of crop

Before

After
Scouting for insects / diseases
Discontinuous system is good
Discontinuous system for disease control
Special care of nursery
1 foot off ground
<table>
<thead>
<tr>
<th>Root fungi</th>
<th>Rootshield, Pre-stop, Mycostop</th>
</tr>
</thead>
<tbody>
<tr>
<td>GSB, PM, DM</td>
<td>Rhapsody, Serenade, Sonata</td>
</tr>
</tbody>
</table>
Gliocladium (Pre-stop) is parasitic on Rhizoctonia
Trichoderma for disease control
(harzianum, viride, hamatum species)
Crop Free Period

Solarization (130F)
Cull Pile

- Away from greenhouse
- Make hole
- Cover with soil later on
Lab selection

Choose a lab that gives quick diagnosis
You can send sample to me

- Pack good
- Include shipping documents (permit)
- Use Red/white shipping label (from me)
- Ship

Packing

Ready to ship
Risk inventory

- Weeds
- Other cucurbits
- Proximity of cull pile
- History of previous crop

Weed risk
## End of Season: Check List

<table>
<thead>
<tr>
<th>Task</th>
<th>Status</th>
</tr>
</thead>
<tbody>
<tr>
<td>Trash hole is ready</td>
<td>✔️</td>
</tr>
<tr>
<td>Irrigation lines flushed and disinfected</td>
<td>✔️</td>
</tr>
<tr>
<td>Nursery is treated for fungus gnats</td>
<td>✔️</td>
</tr>
<tr>
<td>Foot bath ready</td>
<td>✔️</td>
</tr>
<tr>
<td>Tools, carts etc disinfected</td>
<td>✔️</td>
</tr>
<tr>
<td>Weeds, debris removed</td>
<td>✔️</td>
</tr>
<tr>
<td>Scouting supplies are ready</td>
<td>✔️</td>
</tr>
<tr>
<td>Met with staff and reviewed</td>
<td>✔️</td>
</tr>
</tbody>
</table>
Enjoy healthy crop of cucumber