Cucumber disease control

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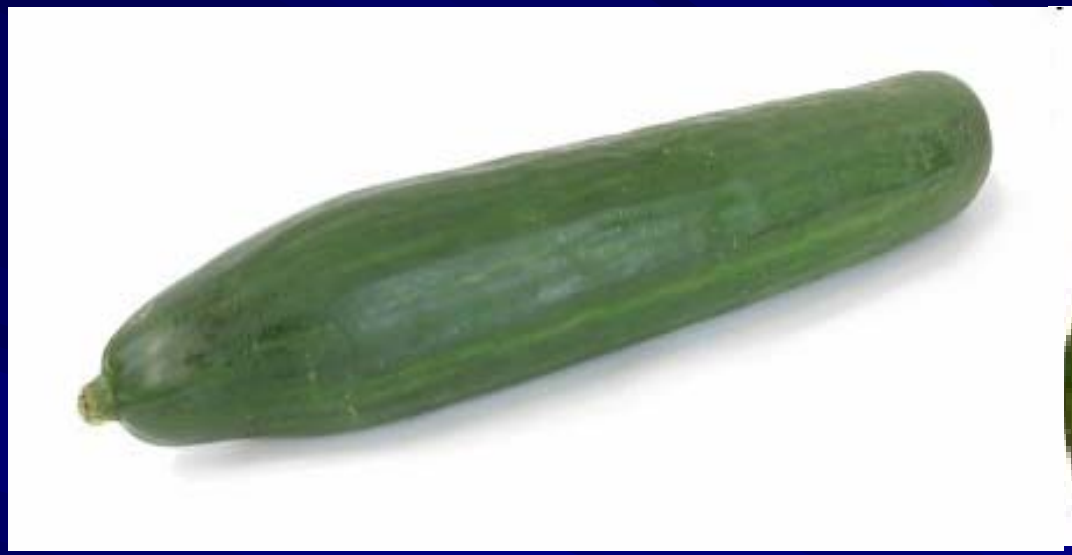
Agenda

- Symptom recognition
- Where the disease come from
- Disease Management
- Check list

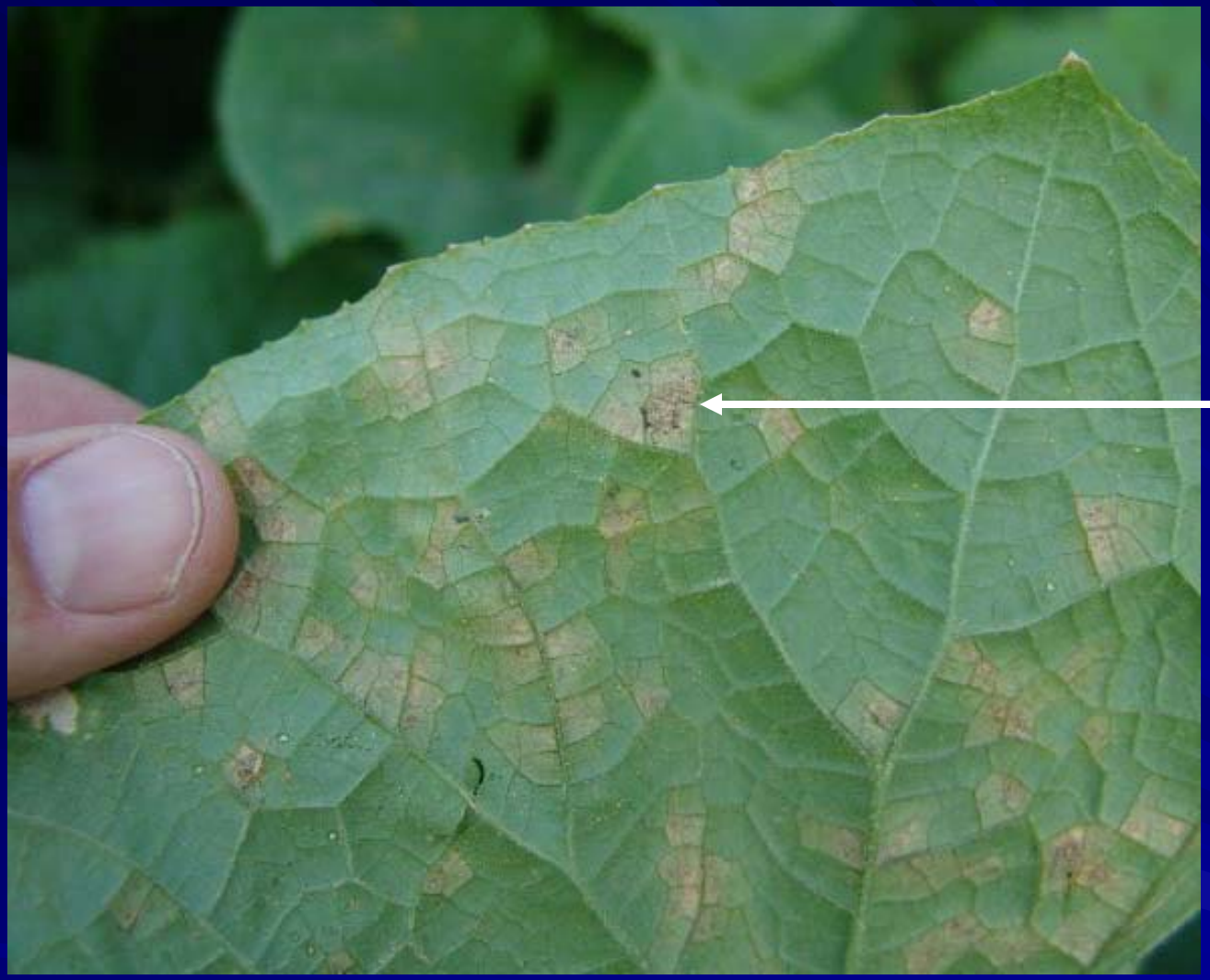


European

American

Disease control is same for all cucumbers

Downy Mildew



Downy Mildew

Lower surface 40X

Black spores

Laboratory: Spores at 100X

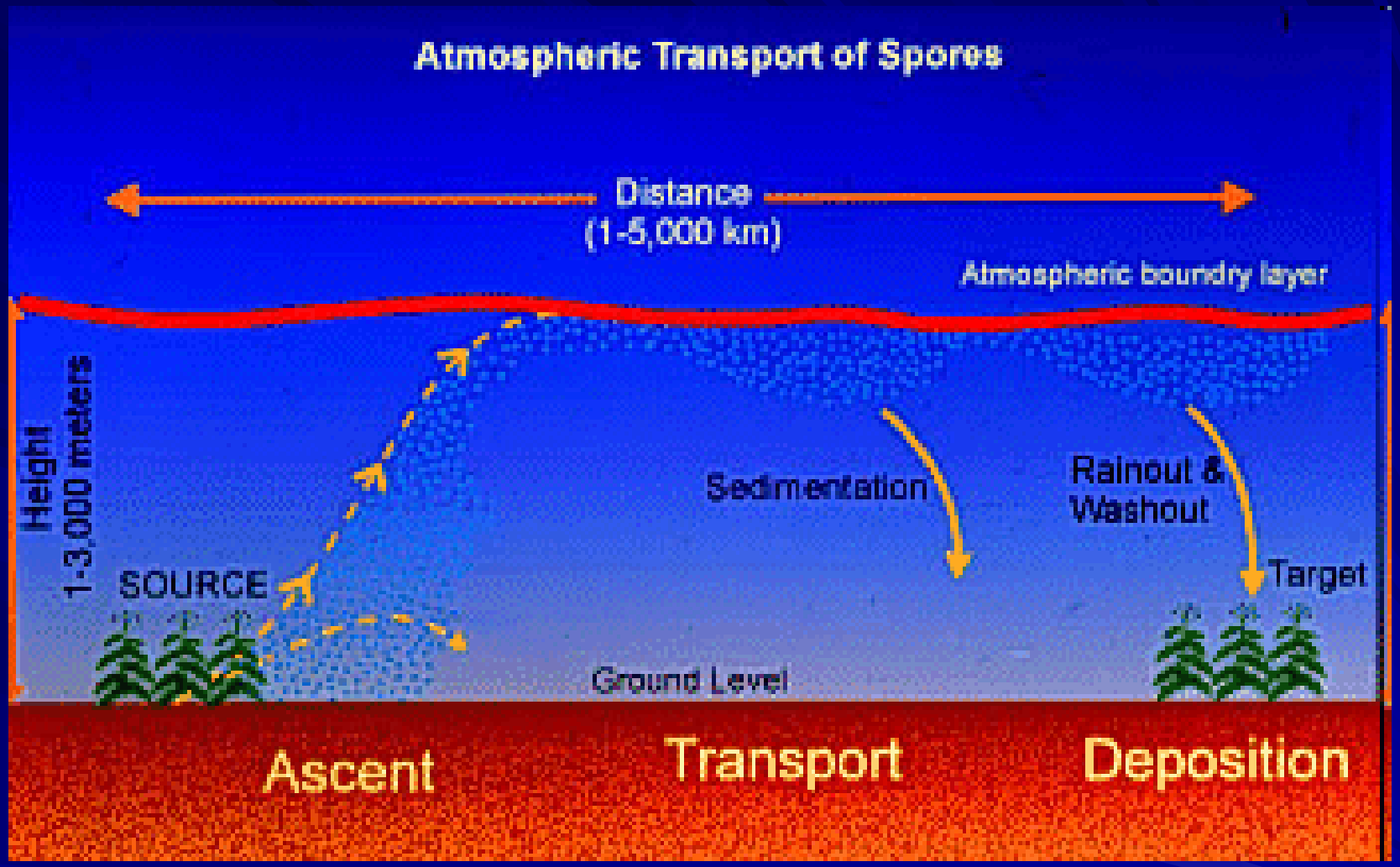
Downy Mildew

Cucumber is more susceptible than other cucurbits

All 5 races attack cucumber

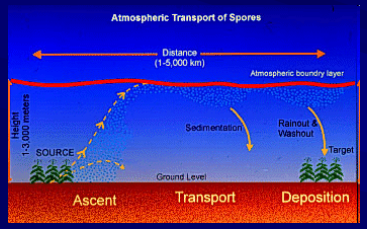
Downy mildew development

- 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

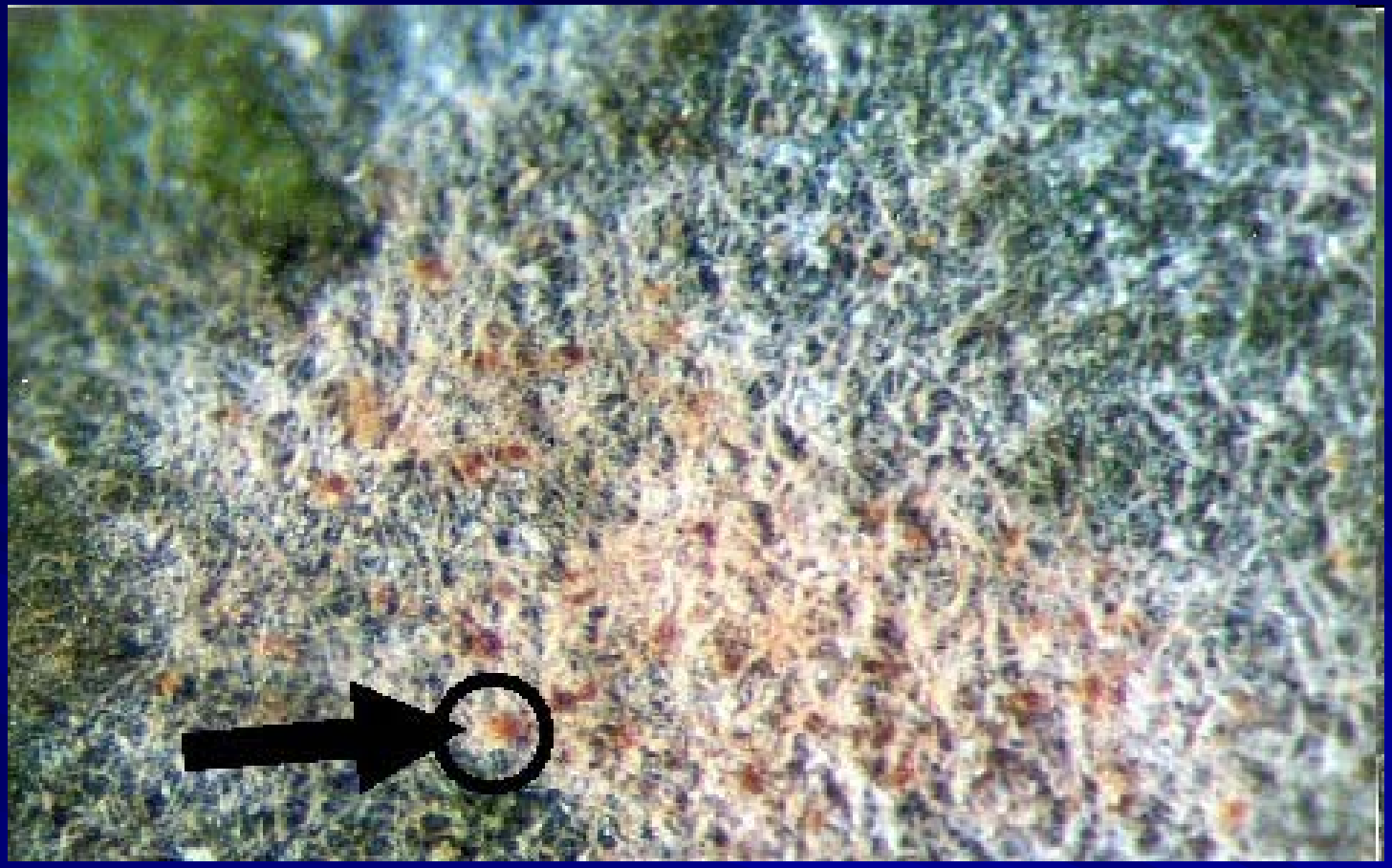


- Cool moist conditions at the source
- Wind direction, Cloudy days
- Chances of rain
- Cool conditions at the farm

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

Leaf symptoms

Stem infections

Gummy stem blight

Black dots - Pycnidia

Gummy ooze

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)

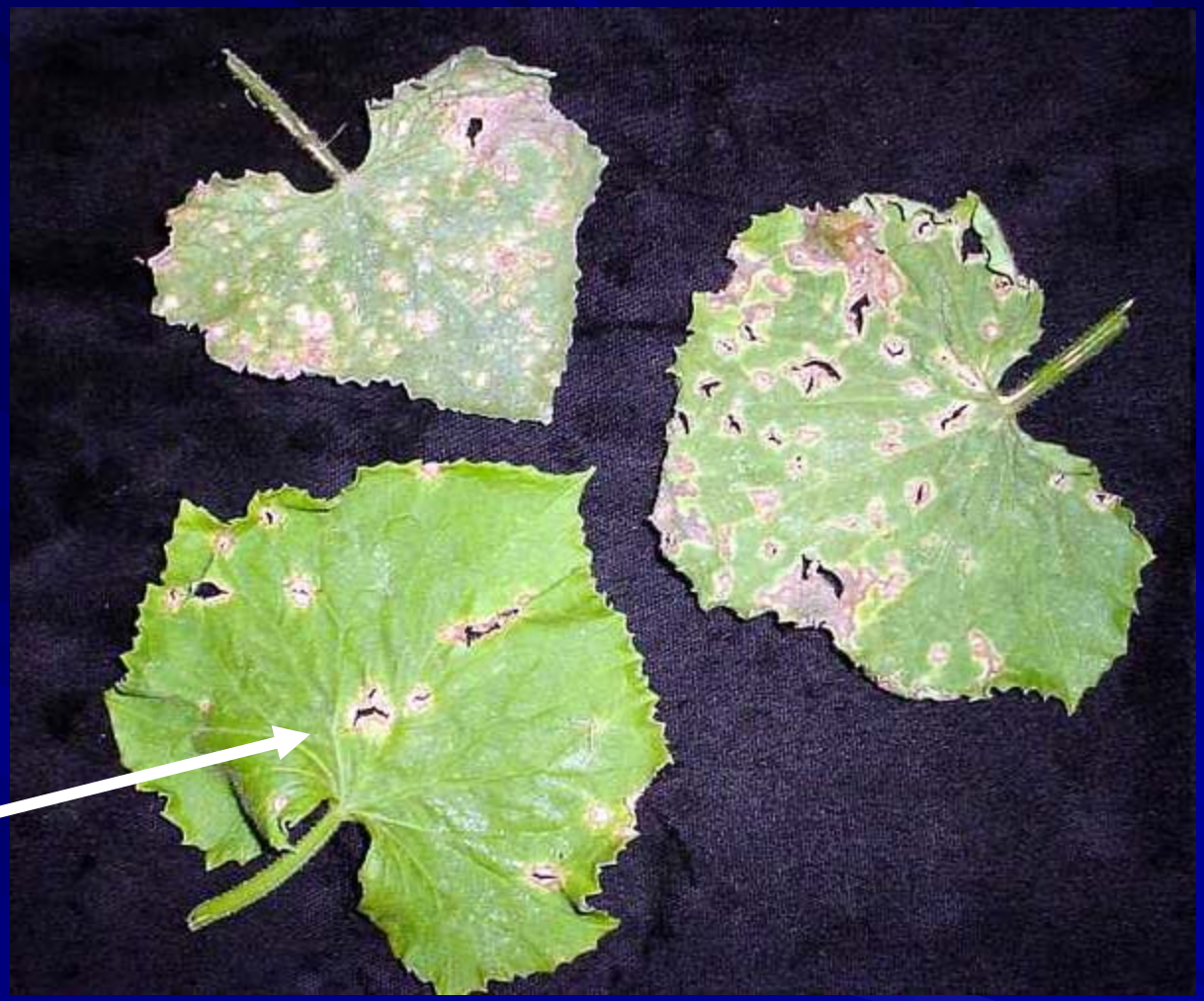
Gummy stem blight
Spread within your farm

- 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

Cracking lesions



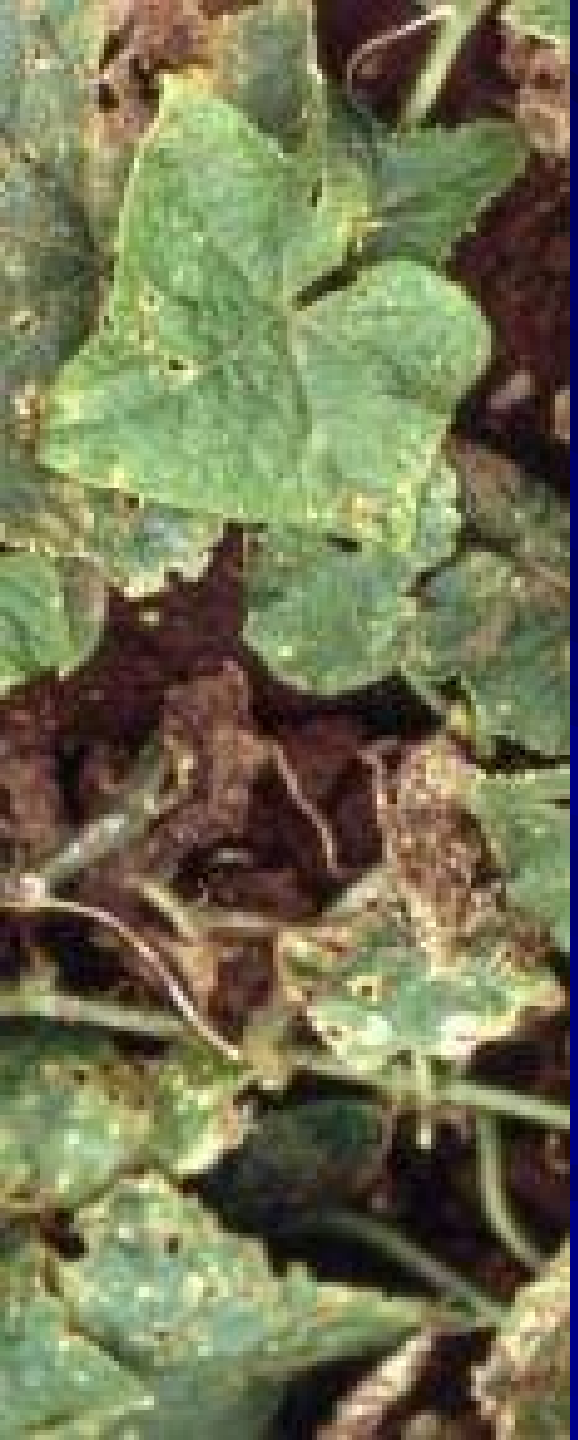
Anthracnose

Anthracnose fruiting bodies

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

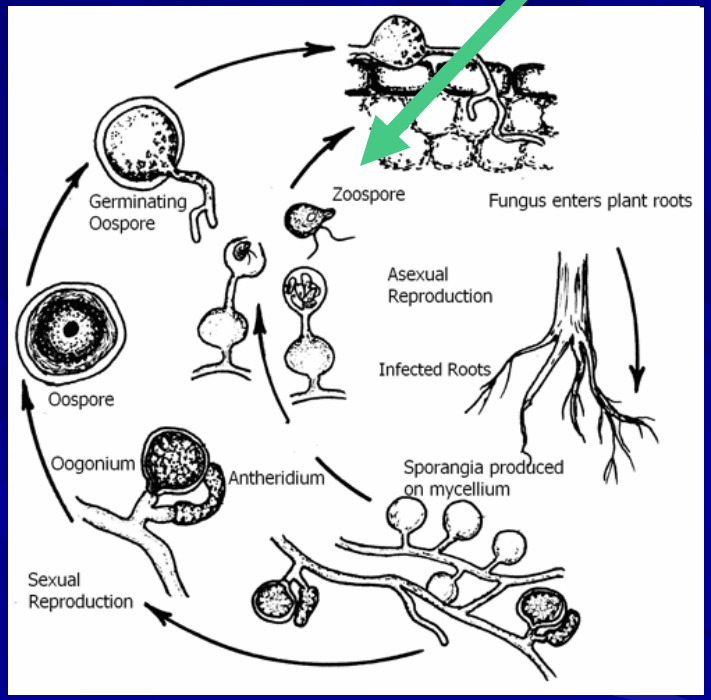
Pythium

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

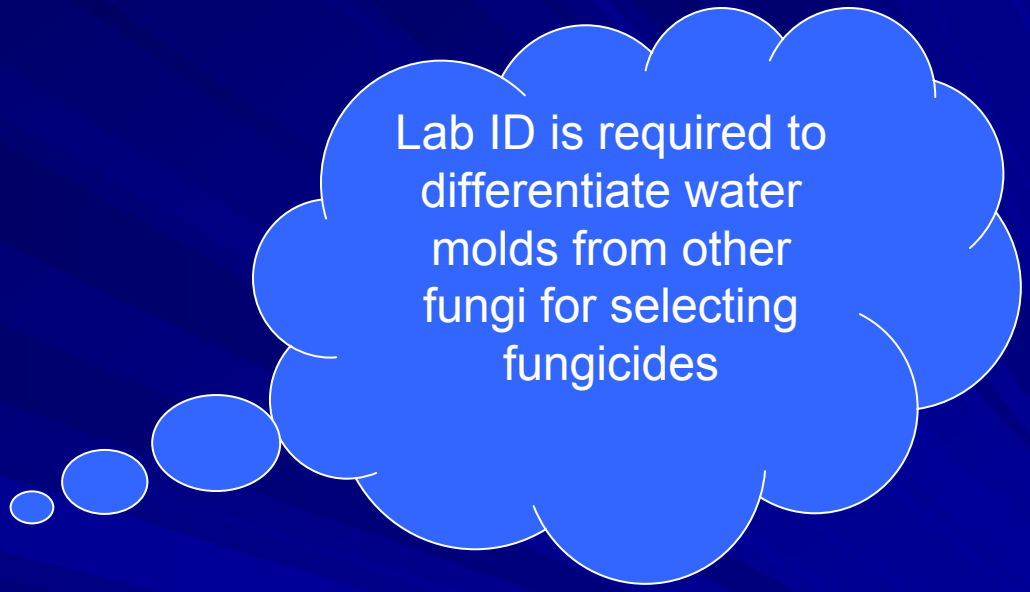
Pythium Control

- 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



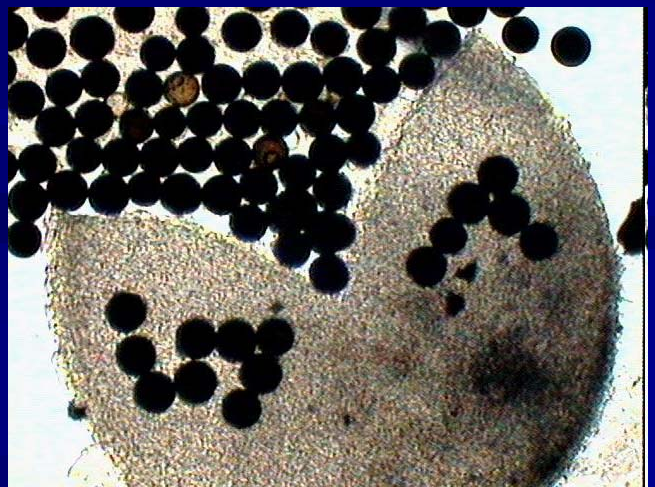
F.o. radicis-cucumerinum

Fusarium stem and root rot

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

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

Squash Mosaic Virus

Viruses
How they get to your farm

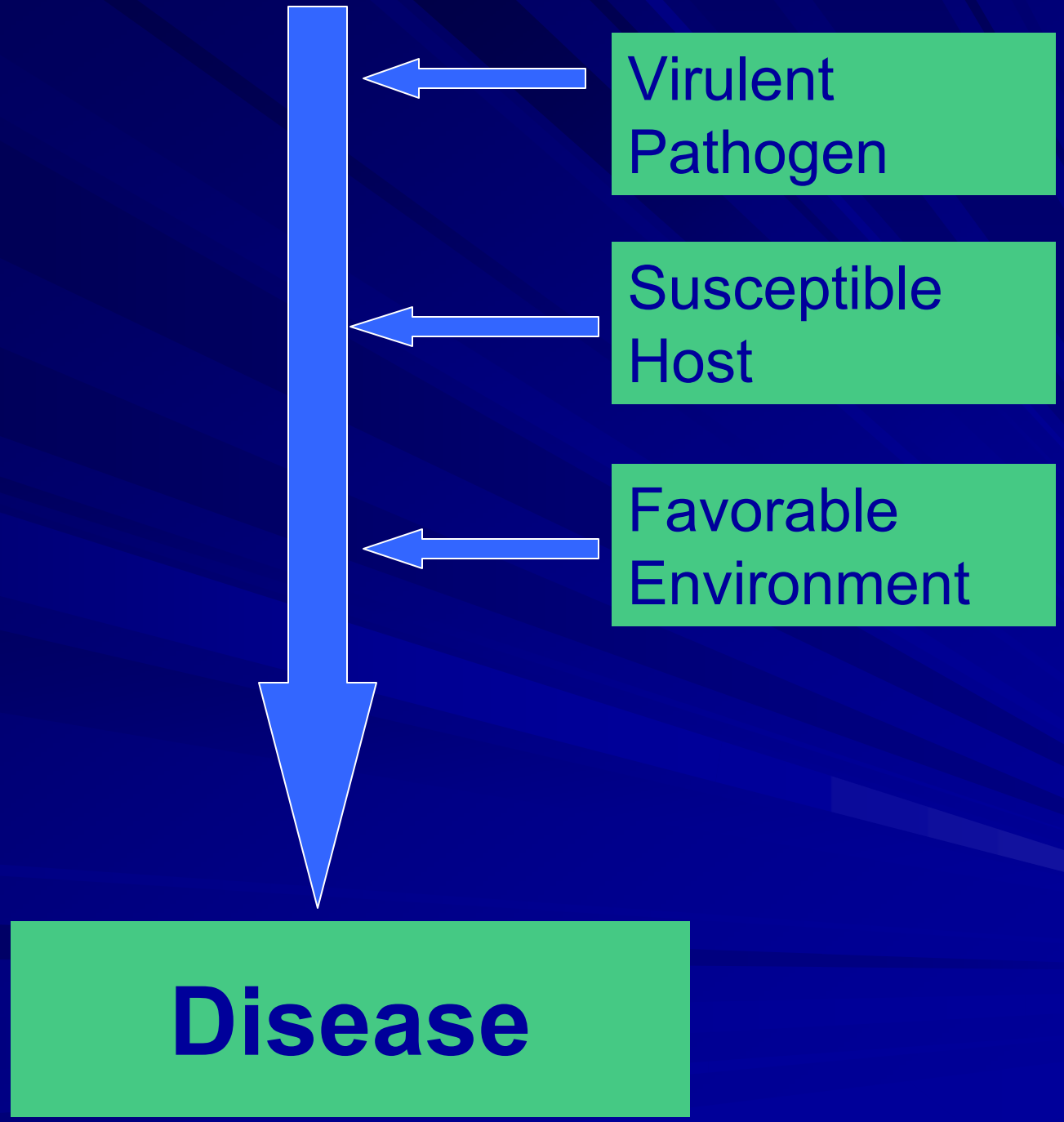
- Insects bring virus
- CMV infects many plant species and is seed borne in 19 species

Viruses

Cucumber mosaic	Aphid
Zucchini yellow mosaic	Aphid
Papaya ring spot	Aphid
Watermelon mosaic	Aphid
Squash mosaic	Seed, Beetle
Cucumber green mottle mosaic	Seed
Cucumber vein yellowing	White fly

Zucchini yellow mosaic

Disease management


Virulent Pathogen
Susceptible Host
Favorable Environment
Disease

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

Disconinuous system for disease control

Special care of nursery
1 foot off ground

Use Biologicals

Root fungi	Rootshield, Pre-stop, Mycostop
GSB, PM, DM	Rhapsody, Serenade, Sonata

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

Packing

Ready to ship

You can send sample to me

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

Risk inventory

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

Weed risk

End of Season: Check List

Trash hole is ready	✓
Irrigation lines flushed and disinfected	✓
Nursery is treated for fungus gnats	✓
Foot bath ready	✓
Tools, carts etc disinfected	✓
Weeds, debris removed	✓
Scouting supplies are ready	✓
Met with staff and reviewed	✓

Enjoy healthy crop of cucumber