

## Organic Disease Management



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## Disease (and Pest) Management Principals

- Identify the concerns
- Manage the environment
- Scout for early identification
- Take action early

## Approaches to Disease (and Pest) Mgmt.

- Cultural – Cultivar selection; moisture and fertility
- Physical/Mechanical – Barriers and cultivation
- Biological – Attracting, releasing or applying biological agents; organic matter management
- Chemical – Sprays or other chemical applications
- Economic thresholds for action

## Cultural

- Select cultivars/varieties for disease resistance
- Crop Rotation
- Moisture Management (especially on foliage)
- Sanitation
- Fertility management (especially Nitrogen)

## Moisture Management



## Frost Fabric/Row Cover - Physical



### Low Tunnels – Physical



### Caterpillar and High Tunnels – Physical



### Diseases for Today

**Bacterial**

- Wilt
- Canker
- Speck
- Spot

**Viruses**

- TSWV
- TMV
- CMV

**Fungal (and fungal-like)**

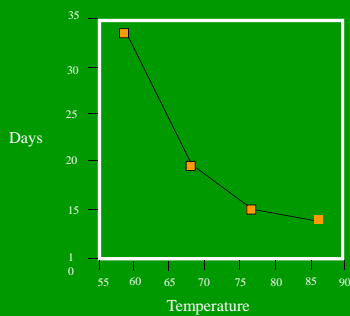
- Powdery Mildew
- Downy Mildew
- Anthracnose
- Early and Late Blight
- Gray Mold (*Botrytis*)
- *Sclerotinia*
- *Phytophthora*
- *Fusarium*
- *Septoria*
- *Cercospora*

### Aphids



- Cultural –**
  - Ant control
  - Clean transplants
- Physical/Mechanical –**
  - Clean transplants
  - Water sprays
- Biological –**
  - Lady Beetles, Parasitic Wasp
- Chemical –**
  - Insecticidal Soaps

Effect of Temperature on Thrips development  
33+ days at 60F, but 14 days at 80F



### Bacterial Wilt



## Striped and Spotted Cuc Beetle



Cultural –  
**Bacterial Wilt** Resistant Cultivars  
 Plow under residues  
 Long distance rotation

Physical/Mechanical –  
 Row covers or tunnels  
 Trap crops (then tilling)



Biological –  
 Parasitic nematode for larvae

Chemical –  
 Kaolin Clay  
 Pyrethrum  
 Neem

## Yellow Sticky Cards for ID and Pop.



## Releasing Predators and Parasites



## Bacterial Canker, Speck, and Spot

-Tomato and Pepper



- Cultural:
  - Seed hot water treatment (122F for 25 min.)
  - Resistant varieties
  - Sanitation (including tool)
  - Moisture

- Chemical:
  - Copper applications

Symptoms: Wilting and browning at margins, brown stem cankers, spots/specks on fruit

## Powdery and Downy Mildew

-Cucs, Brassicas, Onions, Lettuce



- Cultural:
  - Rotation
  - Moisture and humidity
  - Leaf removal
  - Resistant varieties
- Chemical:
  - Copper
  - Potassium Biocarbonate

Symptoms: White, powdery leaf surface or Sporangiohores

## Anthracnose


-Tomato, Cucumber



- Cultural:
  - Moisture management
  - Trellising and pruning
  - Hot water seed treatment
- Chemical:
  - Prevent spore formation
  - Sulfur
  - Copper

Symptoms: Small, sunken lesions followed by black fungus


### Early and Late Blight -Tomato, Potato



- Cultural:
  - Moisture management
  - Sanitation
  - NO potato cull piles
  - Rotation
  - Pruning (tomato)
  - Resistant Varieties
  - Tunnels
- Chemical
  - Copper hydroxide
  - Oxidate
  - Serenade (*B. subtilis*)

Symptoms: Small spots on leaves followed by lesions on stem


### Gray Mold (*Botrytis*) Tomato, Lettuce, Raspberries



- Cultural:
  - Moisture management
- Chemical:
  - Copper hydroxide

Symptoms: Lesions on leaves and stems turning to fuzzy gray mold


### White Mold (*Sclerotinia*) -Tomato, Lettuce



- Cultural:
  - Rotation
  - Soil moisture mgmt.
  - Foliar moisture/humidity
  - Plant density
  - Removal
- Chemical:
  - Oxidate

Symptoms: Lesions with rotting stems leave tissue, white growth

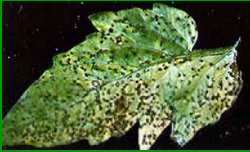
### *Phytophthora, Fusarium, Phythium, Rhizoctonia* -Pepper, cucurbits, melons, potato



- Cultural:
  - Moisture management
  - Rotation
- Chemical:
  - Oxidate
  - Rootshield

Symptoms: Damping-off, wilt (because of root damage/death)


### Septoria Leaf Spot -Tomato



- Cultural:
  - Clean seed
  - Foliar mositure
- Chemical:
  - Copper

Symptoms: Small, sunken lesions followed by black fungus on ripe fruit

### *Cercospora* Spinach, beets, chard



- Cultural:
  - Moisture management
  - Mulch (to limit splashing)
- Chemical:
  - Copper

Symptoms: Small, circular, dark lesions with yellow halo

