Diseases of Vegetables

Tomato Leaf Blights

- **Causes**
  - *Alternaria solani* (early blight)
  - *Septoria lycopersici* (Septoria leaf spot)
  - *Phytophthora infestans* (late blight)
- **Hosts**
  - Tomato
  - Potato (early blight, late blight)
- **Environmental trigger:** Wet weather

Control (early blight, Septoria leaf spot)
- Remove and destroy infested debris
- Move tomatoes to new location (?)
- Plant resistant varieties (?)
- Space plants far apart
- Mulch around the base of plants
- **DO NOT** over-mulch

Control (early blight, Septoria leaf spot)
- DO NOT overhead water
- Thin plants/remove healthy leaves
- Remove diseased leaves
- Use fungicides to prevent infections
  - Copper, neem oil
  - Applications every 7-14 days
**Diseases of Vegetables**

**Tomato Leaf Blights**

- **Control (late blight)**
  - Remove and destroy
    - Infected plants, fruits, tubers
    - Volunteer tomato and potato plants
    - Weed hosts
  - DO NOT use last year’s potatoes as seed potatoes
  - DO use certified seed potatoes

- **Infected plants, fruits, tubers**
- **Volunteer tomato and potato plants**
- **Weed hosts**

**Tomato Leaf Blights**

- **Control (late blight)**
  - Grow resistant tomato varieties

**Tomato Leaf Blights**

- **Cause:** Calcium deficiency
- **Affected plants**
  - Tomato
  - Pepper
  - Eggplant
  - Cucurbits (cucumber, squash, pumpkin)
- **Environmental trigger:** Drought

**Blossom End Rot**

- **Management**
  - Test soil to determine calcium level
  - Add calcium as needed
    - Bone meal
    - Egg shells
    - NOT lime (usually)
  - Water plants adequately and uniformly
Diseases of Vegetables

**Powdery Mildew**

- **Causes**
  - *Sphaerotheca fuliginea*
  - *Erysiphe cichorecearum*
  - *Oidium spp.*
- **Hosts**: Cucurbits (cucumber, squash, pumpkin)
- **Environmental trigger**: High humidity

---

**Control**

- Plant resistant varieties
- DO NOT crowd plants
- Thin vines
- Grow plants on a trellis

---

**Aster Yellows**

- **Cause**: Aster yellows phytoplasma
- **Hosts**
  - Carrot
  - Potato
- **Environmental trigger**: None
- **Transmission**: Aster leafhopper

---

**Control**

- Apply fungicides for control
  - Sulfur, neem oil, other plant-based oils
  - 1.5 Tbsp baking soda + 3 Tbsp light-weight horticultural oil in 1 gal water
  - Apply when humidity is >60-70%
  - Apply every 7-14 days
**Diseases of Vegetables**

**Aster Yellows**
- **Control**
  - Remove infected plants
  - Use insecticides to control leafhoppers (?)

**Common Smut**
- **Cause:** *Ustilago maydis*
- **Host:** Corn
- **Environmental trigger:** Hail

**Common Smut**
- **Control**
  - Plant resistant varieties
  - Reduce physical damage to corn plants
  - DO NOT use chemical or biological controls
  - Give up on your corn and eat the smut

**Herbicide Injury**
- **Causes**
  - Growth regulator herbicides
    - 2,4-D
    - Dicamba
  - Other herbicides
- **Affected plants**
  - All vegetables
  - Tomatoes
Diseases of Vegetables

Herbicide Injury

• Management
  – DO NOT use herbicides
  – If you or your neighbors do use herbicides, make sure that you or they
    • Follow application directions exactly
    • Apply herbicides at low wind speeds (< 5 mph)
    • DO NOT apply herbicides too close to sensitive plants
    • Apply herbicides at low pressure
    • Use amine rather than ester forms of herbicides

Common Scab

• Cause: *Streptomyces scabies*

• Hosts
  – Potato
  – Carrot
  – Other root crops

• Environmental trigger: High soil pH

Vascular Wilts

• Hosts
  – Solanaceous vegetables (tomato, potato, pepper, eggplant)
  – Cucurbits (pumpkin, squash, cucumber)

• Causes
  – *Verticillium* spp. (*Verticillium* wilt)
  – *Fusarium oxysporum* (*Fusarium* wilt)

• Environmental trigger: Wet weather
Diseases of Vegetables

**Vascular Wilts**

- **Control**
  - Rotate crops to avoid pathogen build-up
  - DO NOT plant susceptible vegetables in infested areas
  - Plant non-hosts in infested areas
  - Plant resistant varieties (VFF)
  - DO NOT over-water
  - DO NOT over-mulch

**Bacterial Wilt**

- **Cause:** *Erwinia tracheiphila*
- **Hosts:** Cucurbits (cucumber, squash, pumpkin)
- **Environmental trigger:** None
- **Transmission:** Cucumber beetles

**Bacterial Wilt**

- **Control**
  - Use floating row covers
  - Remove infected plants
  - If you decide to keep infected plants, water them adequately

**Cucumber Mosaic**

- **Cause:** Cucumber mosaic virus
- **Hosts**
  - Cucurbits
  - Pepper
  - Tomato
  - Other vegetables
- **Environmental trigger:** None
- **Transmission:** Aphids
Diseases of Vegetables

Cucumber Mosaic

- Control
  - Plant resistant/tolerant varieties
  - Plant based resistance
  - Plant based tolerance
  - Genetically modified plants
  - Eliminate weed hosts
  - Attempt to control aphid vectors (?)
  - DO NOT use chemical or biological controls

Diseases of Vegetables

White Mold

- Cause: *Sclerotinia sclerotiorum*
- Hosts
  - Snap beans
  - Carrots
  - Many other vegetables
- Environmental trigger: Cool, humid weather

Diseases of Vegetables

White Mold

- Control
  - Buy high quality vegetable seed
  - Prevent introduction through other seed
  - Routinely rotate crops
  - Avoid planting susceptible vegetables in infested areas (5-7 yrs)
  - Plant non-hosts in infested areas
  - Plant beans with wider row spacings

Diseases of Vegetables

White Mold

- Control
  - DO NOT over-water
  - DO NOT over-mulch
  - DO NOT over-fertilize
  - Control broad-leaf weeds
  - Use biological control products
    - *Coniothyrium minitans*
    - Parasitizes sclerotia

Diseases of Vegetables

Root Rots

- Causes
  - *Pythium* spp. (*Pythium* root rot)
  - *Rhizoctonia solani* (*Rhizoctonia* root rot)
- Hosts
  - Snap beans
  - Other vegetables
- Environmental trigger: Wet, cool soils
Diseases of Vegetables

**Root Rots**

- **Control**
  - Routinely rotate crops
  - DO NOT over-water
  - DO NOT over-mulch

**Bacterial Soft Rot**

- **Cause:** *Pectobacterium carotovorum*
- **Hosts**
  - Potato
  - Carrot
  - Most other vegetables
- **Environmental triggers**
  - Wet soils
  - Wet storage conditions

**Bean Leaf Diseases**

- **Causes**
  - *Pseudomonas syringae pv. syringae* (bacterial brown spot)
  - *Pseudomonas syringae pv. phaseolicola* (halo blight)
  - *Xanthomonas campestris pv. phaseoli* (common blight)
Diseases of Vegetables
Bean Leaf Diseases

• Hosts
  – Snap bean
  – Kidney bean
  – Lima bean
• Environmental trigger: Driving rain (?)

Diseases of Vegetables
Bean Leaf Diseases

• Control
  – Purchase high quality seed
  – Use resistant varieties where available
  – DO NOT overhead water
  – Apply bactericides (copper) for control (?)

Diseases of Vegetables
Common Rust

• Cause: *Puccinia sorghi*
• Host: Corn
• Environmental triggers
  – Moderate temperatures
  – Long periods of leaf wetness

Diseases of Vegetables
Common Rust

• Control
  – Plant resistant varieties
Diseases of Vegetables
Damping-Off/Seedling Blights

- Pathogens
  - Pythium spp.
  - Rhizoctonia solani
  - Fusarium spp.
- Hosts: Any vegetable seedling
- Environmental trigger: Cool, wet soils

Diseases of Vegetables
Damping-Off/Seedling Blights

- Control
  - Use a pasteurized soil mixture
  - Use decontaminated pots, working surfaces and tools
    - 10% bleach
    - 70% alcohol
    - Commercial disinfectants

Diseases of Vegetables
Damping-Off/Seedling Blights

- Control
  - Moderate soil moisture
    - Use a soil with adequate drainage
    - DO NOT over-water
  - Germinate seeds at higher temperatures

Diseases of Vegetables
Damping-Off/Seedling Blights

- Control
  - Use biological control products to protect seedlings
    - Applied as a seed treatment or soil treatment

Where to Go for Help

Plant Disease Diagnostics Clinic
Department of Plant Pathology
University of Wisconsin-Madison
1630 Linden Drive
Madison, WI 53706-1598
(608) 262-2863
pddc@plantpath.wisc.edu
http://pddc.wisc.edu
Follow the clinic on Twitter @UWPDDC