Common Diseases in the Vegetable Garden

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, chlorothalonil
  - Applications every 7-14 days
Common Diseases in the Vegetable Garden

Tomato Leaf Blights

• Control (late blight)
  – Remove infected plants
    • Leaves, stems, fruits, roots, tubers
    • Volunteer tomato and potato plants
    • Weed hosts
  – Destroy infected plants
    • Double bag
    • Landfill
  – DO NOT use last year's potatoes as seed

Tomato Leaf Blights

• Control (late blight)
  – DO use certified seed potatoes
  – Grow resistant tomato varieties

Tomato Leaf Blights

• Control (late blight)
  – Grow resistant tomato varieties

Blossom End Rot

• Cause: Calcium deficiency
• Affected plants
  – Tomato
  – Pepper
  – Eggplant
  – Cucurbits (cucumber, squash, pumpkin)
• Environmental trigger: Drought
Common Diseases in the Vegetable Garden

**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

**Powdery Mildew**

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

**Powdery Mildew**

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

**Powdery Mildew**

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

**Aster Yellows**

- **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
Common Diseases in the Vegetable Garden

Aster Yellows

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

Common Diseases in the Vegetable Garden

Common Smut

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

Common Diseases in the Vegetable Garden

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

Common Diseases in the Vegetable Garden

Herbicide Injury

- **Causes**
  - Growth regulator herbicides
    - 2,4-D
    - Dicamba
  - Other herbicides

- **Affected plants**
  - All vegetables
  - Tomatoes
Common Diseases in the Vegetable Garden

**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

**Common Scab**

- **Control**
  - Plant scab-free potato stock
  - Routinely rotate crops
    - DO NOT grow host plants in an infested areas
    - Plant non-hosts in infested areas
  - Move potatoes to another location
  - Plant scab resistant varieties
  - Lower soil pH
  - DO NOT use chemical or biological controls

**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
Common Diseases in the Vegetable Garden

**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

**Cucumber Mosaic**

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

**Bacterial Wilt**

- **Cause**: *Cucumber mosaic virus*
- **Hosts**
  - Cucurbits
  - Pepper
  - Tomato
  - Other vegetables
- **Environmental trigger**: None
- **Transmission**: Aphids
Common Diseases in the Vegetable Garden

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

Common Diseases in the Vegetable Garden

White Mold

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

Common Diseases in the Vegetable Garden

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

Common Diseases in the Vegetable Garden

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
Common Diseases in the Vegetable Garden

Root Rots

• Causes
  – *Pythium* spp. (*Pythium* root rot)
  – *Rhizoctonia solani* (*Rhizoctonia* root rot)

• Hosts
  – Snap beans
  – Other vegetables

• Environmental trigger: Wet, cool soils

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

Control

– Moderate soil moisture
– Have good soil fertility (particularly calcium)
– Harvest tubers promptly
– DO NOT bruise/injure tubers
– Keep harvested tubers dry
– Remove any rotted tubers immediately
Common Diseases in the Vegetable Garden

Bean Leaf Diseases

• Causes
  – *Pseudomonas syringae* pv. *syringae* (bacterial brown spot)
  – *Pseudomonas syringae* pv. *phaseolicola* (halo blight)
  – *Xanthomonas campestris* pv. *phaseoli* (common blight)

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

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

Common Diseases in the Vegetable Garden

Common Rust

• Cause: *Puccinia sorghi*
• Host: Corn
• Environmental triggers
  – Moderate temperatures
  – Long periods of leaf wetness
Common Diseases in the Vegetable Garden

**Common Rust**

- Control
  - Plant resistant varieties

**Common Diseases in the Vegetable Garden**

**Damping-Off/Seedling Blights**

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

**Common Diseases in the Vegetable Garden**

**Damping-Off/Seedling Blights**

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

**Common Diseases in the Vegetable Garden**

**Damping-Off/Seedling Blights**

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

**Common Diseases in the Vegetable Garden**

**Damping-Off/Seedling Blights**

- Control
  - Use biological control products to protect seedlings
  - Applied as a seed treatment or soil treatment
Common Diseases in the Vegetable Garden

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