Diseases of Vegetables

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• Causes
  – *Septoria lycopersici* (Septoria leaf spot)
  – *Alternaria solani* (early blight)
  – *Phytophthora infestans* (late blight)

• Hosts
  – Tomato
  – Potato (early blight, late blight)

• Favorable environment: Cool, wet weather

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

Diseases of Vegetables
Fungal Leaf Blights

• Control (early blight, Septoria leaf spot)
  – DO NOT overhead water
  – Remove infected leaf tissue
  – Use fungicides to prevent infections
    • Chlorothalonil, mancozeb
    • Copper
    • Alternate active ingredients (FRAC codes)
    • Apply at 7-14 days intervals
Diseases of Vegetables
Fungal 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

Diseases of Vegetables
Fungal Leaf Blights

• Control (late blight)
  – Grow resistant tomato varieties
    • “Late Blight Management in Tomato with Resistant Varieties”

Diseases of Vegetables
Fungal Leaf Blights

• Control (late blight)
  – Use fungicides to prevent infections
    • Chlorothalonil, mancozeb
    • Copper
    • Alternate active ingredients (FRAC codes)
    • Start applications based on Blitecast (http://www.plantpath.wisc.edu/wivegdis/)
    • Apply at 7-14 day intervals

Diseases of Vegetables
Blossom End Rot

• Cause: Calcium deficiency

• Affected plants
  – Tomato
  – Pepper
  – Eggplant
  – Cucurbits (cucumber, squash, pumpkin)

• Favorable Environment: Drought

Diseases of Vegetables
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**
  - Miscellaneous powdery mildew fungi
    - *Oidium* spp.
- **Hosts**
  - Cucurbits (cucumber, squash, pumpkin)
  - Other vegetables (pea, tomato)
- **Favorable environment:** High humidity

**Control**
- Remove and destroy plant debris
  - Burn (where allowed)
  - Deep bury
  - Hot compost
- Reduce humidity
  - Plant less densely/thin existing stands
  - Grow vining plants on a trellis
- Use resistant cultivars/varieties

**Powdery Mildew**

- **Control**
  - Use fungicides to prevent infections
    - Dithiocarbamates, myclobutanil, propiconazole, tebuconazole, thiophanate-methyl
    - Sulfur, neem oil, other plant-based oils
    - 1.5 Tbsp baking soda + 3 Tbsp light-weight horticultural oil in 1 gal water
    - Alternate active ingredients (FRAC codes)
    - Apply when humidity is >60-70%
    - Apply every 7-14 days

**Black Rot**

- **Cause:** *Xanthomonas campestris* pv. *campestris*
- **Hosts:** Crucifers
  - Brussels sprouts, cabbage, collards
  - Broccoli, cauliflower, kale, kohlrabi, rutabaga, turnips
- **Favorable environment:** Wet weather
**Diseases of Vegetables**

**Black Rot**

- **Control**
  - Buy high quality (certified pathogen-free) seed or transplants
  - Heat treat seeds
    - 35 min, 122°F (Brussels sprouts, cabbage, collards)
    - 20 min, 122°F (broccoli, cauliflower, kale, kohlrabi, rutabaga, turnips)

- **35 min, 122°F** (Brussels sprouts, cabbage, collards)
- **20 min, 122°F** (broccoli, cauliflower, kale, kohlrabi, rutabaga, turnips)

**Diseases of Vegetables**

**Black Rot**

- **Control**
  - Routinely rotate crops
  - DO NOT grow host plants in an infested areas
  - Plant non-hosts in infested areas
  - Fertilize properly (particularly nitrogen)
  - DO NOT overhead water
  - DO NOT handle plants when wet
  - Remove and dispose of contaminated plants (burn, bury, hot compost)

**Diseases of Vegetables**

**Black Rot**

- **Control**
  - Decontaminate infested items
    - 10% bleach
    - 70% alcohol
    - Commercial disinfectants
  - Use bactericides to prevent infections
    - Copper
    - Apply at 7-14 days intervals
    - Tolerant bacterial strains are a problem

**Diseases of Vegetables**

**Aster Yellows**

- **Cause:** Aster yellows phytoplasma
- **Hosts**
  - Carrot
  - Potato
  - Other vegetables
- **Favorable environment:** None
- **Transmission:** Aster leafhopper

**Diseases of Vegetables**

**Aster Yellows**

- **Control**
  - Remove diseased plant material and debris
    - Hot compost
    - Bury
    - Burn (where allowed)
  - Control leafhopper vector (?)
Common Smut

- **Cause:** *Ustilago maydis*
- **Host:** Sweet corn
- **Favorable environment**
  - None (ear infections)
  - Hail (leaf and stalk infections)

**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 (huitlacoche)

Common Scab

- **Cause:** *Streptomyces scabies*
- **Hosts**
  - Potato
  - Carrot
  - Other root crops
- **Favorable environment:** High soil pH

**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
Diseases of Vegetables

Walnut Toxicity

• **Cause:** Juglones
  – Black walnut
  – Butternut
  – Hickory

• **Affected plants**
  – Many vegetables
  – Asparagus, cabbage
  – Tomato, potato, pepper, eggplant

 Management
  – **DO NOT** plant sensitive vegetables near walnut trees
  – **Plant** tolerant vegetables
    • Beans
    • Corn
    • Parsnip
  – **Plant** sensitive vegetables
    • in raised beds
    • in pots

• **Management**
  – Keep walnut leaves and fruits out of your garden
  – **DO NOT** compost walnut leaves and fruits
  – Remove volunteer walnut trees
  – Remove mature walnut trees (?)

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

Diseases of Vegetables
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@wisc.edu
http://pddc.wisc.edu
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