Vegetable Diseases

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2023 PDDC Plant Disease Talks

Vegetable Diseases

Fungal Leaf Blights

• Pathogens
  – 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

Vegetable Diseases

Fungal Leaf Blights

• Control (early blight, Septoria leaf spot)
  – Remove and destroy contaminated debris
    • Burn (where allowed)
    • Deep bury
    • Hot compost
  – Move tomatoes to new location

Vegetable Diseases

Fungal Leaf Blights

• Control (early blight, Septoria leaf spot)
  – Plant resistant varieties
  – Space plants far apart
  – Mulch around the base of plants
  – DO NOT overmulch
### Vegetable Diseases
#### Fungal Leaf Blights

**• Control (early blight, Septoria leaf spot)**
- DO NOT overhead water
- Thin plants as they grow
- Use fungicides to prevent infections
  - Chlorothalonil, mancozeb
  - Copper
  - Alternate active ingredients (FRAC codes)
  - Apply at 7-14 days intervals

**• Control (late blight)**
- Remove any infected plants and plant parts
  - Infected tomato/potato plants including fruits and tubers
  - Volunteer tomato and potato plants
  - Weed hosts
- Destroy any infected plants and plant parts
  - Burn (where allowed)
  - Double bag and landfill

#### Cause:
- Calcium deficiency

#### Affected plants
- Tomato
- Pepper
- Eggplant
- Cucurbits (cucumber, squash, pumpkin, watermelon)

#### Favorable Environment:
- Drought

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**• Control (late blight)**
- DO NOT use last year’s potatoes as seed
- DO use certified seed potatoes
- Grow resistant tomato varieties

*“Late Blight Management in Tomato with Resistant Varieties”* ([https://eorganic.org/node/10822](https://eorganic.org/node/10822))

**• Control (late blight)**
- Use fungicides to prevent infections
  - Chlorothalonil, mancozeb
  - Copper
  - Alternate active ingredients (FRAC codes)
  - Start applications based on Blitecast ([https://wisconsinpotatoes.com/blog-news/](https://wisconsinpotatoes.com/blog-news/))
  - Apply at 7-14 day intervals
**Vegetable Diseases**

**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

**Vegetable Diseases**

**Walnut Toxicity**

- **Cause:** Juglones
  - Black walnut
  - Butternut
  - Hickory
- **Affected plants**
  - Many vegetables
  - Tomato, potato, pepper, eggplant
  - Asparagus, cabbage

**Vegetable Diseases**

**Walnut Toxicity**

- **Management**
  - DO NOT plant sensitive vegetables near walnut trees
  - Plant tolerant vegetables
    - Beans
    - Corn
    - Parsnip
    - Beet
    - Melon
    - Squash
    - Carrot
    - Onion
  - Plant sensitive vegetables
    - in raised beds
    - in pots

**Vegetable Diseases**

**Walnut Toxicity**

- **Pathogens**
  - *Verticillium* spp. (*Verticillium* wilt)
  - *Fusarium oxysporum* (*Fusarium* wilt)
- **Hosts**
  - Solanaceous vegetables
    (tomato, potato, pepper, eggplant)
  - Cucurbits
    (pumpkin, squash, cucumber, watermelon)
**Vegetable Diseases**

**Vascular Wilts**

- **Favorable environment**
  - Wet weather (for infection)
  - Dry weather (for symptom development)

- **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 overwater
  - DO NOT overmulch
  - DO NOT use fungicides or biological controls

**Vegetable Diseases**

**Herbicide Injury**

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

- **Affected plants**
  - All vegetables
  - Tomatoes

- **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
**Vegetable Diseases**

**Powdery Mildew**

- **Pathogens**
  - Miscellaneous powdery mildew fungi
  - *Oidium* spp.

- **Hosts**
  - Cucurbits (cucumber, squash, pumpkin)
  - Other vegetables (pea, tomato)

- **Favorable environment:** High humidity

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**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

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**Vegetable Diseases**

**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

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**Vegetable Diseases**

**Black Rot**

- **Pathogen:** *Xanthomonas campestris pv. campestris*

- **Hosts:** Crucifers
  - Brussels sprouts, cabbage, collards
  - Broccoli, cauliflower, kale, kohlrabi, rutabaga, turnips

- **Favorable environment:** Wet weather
**Vegetable Diseases**

**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)

**Vegetable Diseases**

**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

**Vegetable Diseases**

**Common Scab**

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

**Vegetable Diseases**

**Black Rot**

- **Control**
  - Remove and dispose of contaminated plants
    - Burn (where allowed)
    - Deep bury
    - Hot compost
  - Decontaminate infested items
    (70% alcohol, disinfectants, bleach)

**Vegetable Diseases**

**Black Rot**

- **Control**
  - Use bactericides to prevent infections
    - Copper
    - Apply at 7-14 days intervals
    - Tolerant bacterial strains are a problem
Vegetable Diseases

Common Scab

- Control
  - Plant scab-free potato stock
  - Routinely rotate crops
    - DO NOT grow host plants in 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

Vegetable Diseases

Aster Yellows

- Pathogen: Aster yellow phytoplasma
- Hosts
  - Carrot
  - Potato
  - Other vegetables
- Favorable environment: None
- Transmission: Aster leafhopper

Vegetable Diseases

Common Smut

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

**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 (huítlacoche)

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**Vegetable Diseases**

**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  
https://pddc.wisc.edu  
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