

Olbrich Botanical Gardens Seminar

Vegetable Diseases

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Vegetable Diseases Fungal Leaf Blights

- **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



Vegetable Diseases Fungal Leaf Blights

- **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

Vegetable Diseases 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

Vegetable Diseases 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

Vegetable Diseases Fungal Leaf Blights

- **Control (late blight)**
 - Grow resistant tomato varieties
 - "Late Blight Management in Tomato with Resistant Varieties"
<http://www.extension.org/pages/72678/late-blight-management-in-tomato-with-resistant-varieties#.VVNSsPIVhBd>

Vegetable Diseases 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/wiveqdis/>)
 - Apply at 7-14 day intervals

Vegetable Diseases Bacterial Tomato Diseases

- **Causes**
 - *Pseudomonas syringae* pv. *tomato* (bacterial speck)
 - *Xanthomonas* spp. (bacterial spot)
- **Host: Tomato**
- **Favorable environment**
 - Cool, wet weather (bacterial speck)
 - Warm, wet weather (bacterial spot)



Vegetable Diseases Bacterial Tomato Diseases

- **Control**
 - Dispose of contaminated plant debris (burn, bury, hot compost)
 - Remove and destroy volunteer tomatoes
 - Start with pathogen-free seeds and plants
 - Hot water treat seeds (122°F, 25 minutes)
 - Move tomatoes to new location
 - Space plants far apart

Vegetable Diseases Bacterial Tomato Diseases

- **Control**
 - Mulch around the base of plants
 - DO NOT over-mulch
 - DO NOT overhead water
 - DO NOT handle plants when wet
 - Use bactericides to prevent infections
 - Copper
 - Apply at 7-14 days intervals
 - Tolerant bacterial strains are a problem

Vegetable Diseases Blossom End Rot

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



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
 - Asparagus, cabbage
 - Tomato, potato, pepper, eggplant



Vegetable Diseases Walnut Toxicity

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

Vegetable Diseases Walnut Toxicity

- **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 (?)

Vegetable Diseases Herbicide Injury

- **Causes**
 - Growth regulator herbicides
 - 2,4-D
 - Dicamba
 - Other herbicides
- **Affected plants**
 - All vegetables
 - Tomatoes



Vegetable Diseases 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

Vegetable Diseases Powdery Mildew

- **Causes**
 - Miscellaneous powdery mildew fungi
 - Oidium spp.
- **Hosts**
 - Cucurbits (cucumber, squash, pumpkin)
 - Other vegetables (pea, tomato)
- **Environmental trigger: High humidity**



Vegetable Diseases Powdery Mildew

- **Control**
 - Plant resistant varieties (where available)
 - DO NOT crowd plants
 - Thin plants
 - Grow vining plants on a trellis

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

Vegetable Diseases Aster Yellows

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



Vegetable Diseases Aster Yellows

- **Control**
 - Remove infected plants
 - Use insecticides to control leafhoppers

Vegetable Diseases **Black Rot**

- **Cause:** *Xanthomonas campestris* pv. *campestris*
- **Hosts: Crucifers**
 - Brussels sprouts, cabbage, collards
 - Broccoli, cauliflower, kale, kohlrabi, rutabaga, turnips
- **Environmental trigger:** 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
 - Remove and dispose of contaminated plants (burn, bury, hot compost)

Vegetable Diseases **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

Vegetable Diseases **Common Scab**

- **Cause:** *Streptomyces scabies*
- **Hosts**
 - Potato
 - Carrot
 - Other root crops
- **Environmental trigger:** High soil pH



Vegetable Diseases 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

Vegetable Diseases Common Smut

- **Cause:** *Ustilago maydis*
- **Host:** Sweet corn
- **Environmental trigger**
 - 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 (huitlacoche)

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
<http://pddc.wisc.edu>
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