

Olbrich Botanical Gardens 2014

Common Diseases in the Vegetable Garden

Brian D. Hudelson

Department of Plant Pathology

University of Wisconsin-Madison/Extension



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**



Common Diseases in the Vegetable Garden Tomato Leaf Blights

- **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

Common Diseases in the Vegetable Garden Tomato Leaf Blights

- **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

Common Diseases in the Vegetable Garden Tomato Leaf Blights

- **Control (late blight)**
 - DO use certified seed potatoes
 - Grow resistant tomato varieties
 - Excellent: 'Black Plum', 'Defiant*', 'Iron Lady*', 'Matt's Wild Cherry', 'Mountain Magic*', 'Mountain Merit*', 'Plum Regal*', 'Yellow Currant', 'Yellow Pear'
 - Good: 'Aunt Ginny's Purple', 'Big Rainbow', 'Red Currant', 'Tigerella'

Common Diseases in the Vegetable Garden Tomato Leaf Blights

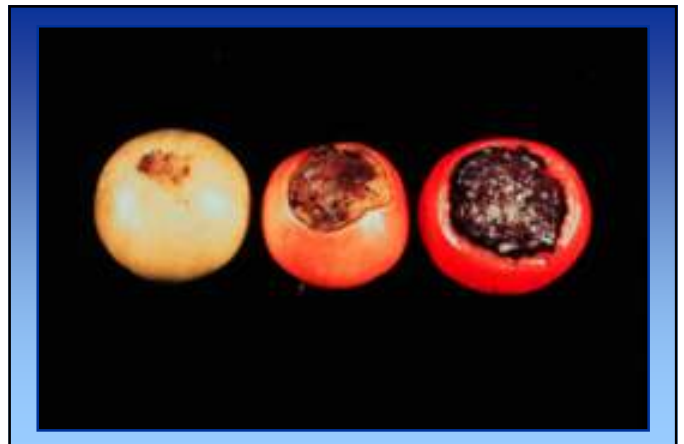
- **Control (late blight)**
 - Grow resistant tomato varieties
 - Moderate: 'Aunt Ruby's German Green', 'Black Krim', 'Juliet', 'Pruden's Purple', 'Red Pearl', 'Slava', 'Stupice', 'Sun Sugar', 'Wapsipinicon', 'Wisconsin 55'

Common Diseases in the Vegetable Garden Tomato Leaf Blights

- **Control (late blight)**
 - Use fungicides to prevent infections
 - Copper, chlorothalonil
 - Start applications based on Blitecast (<http://www.plantpath.wisc.edu/wivegdis/>)
 - Applications every 7-14 days

Common Diseases in the Vegetable Garden 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

Common Diseases in the Vegetable Garden Powdery Mildew

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



Common Diseases in the Vegetable Garden Powdery Mildew

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

Common Diseases in the Vegetable Garden Powdery Mildew

- **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

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



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

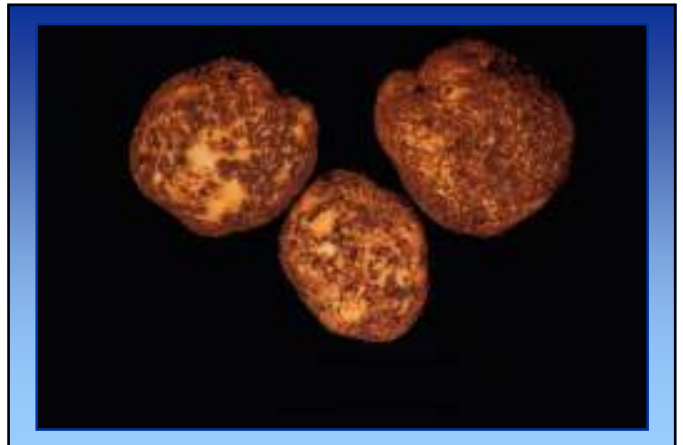


Common Diseases in the Vegetable Garden Herbicide Injury

- **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 Diseases in the Vegetable Garden Common Scab

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



Common Diseases in the Vegetable Garden 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

Common Diseases in the Vegetable Garden 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

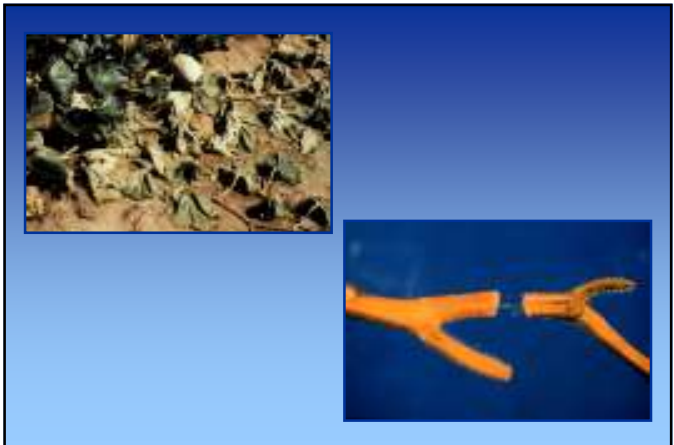


Common Diseases in the Vegetable Garden
Vascular Wilts

- **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

Common Diseases in the Vegetable Garden
Bacterial Wilt

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



Common Diseases in the Vegetable Garden
Bacterial Wilt

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

Common Diseases in the Vegetable Garden
Cucumber Mosaic

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

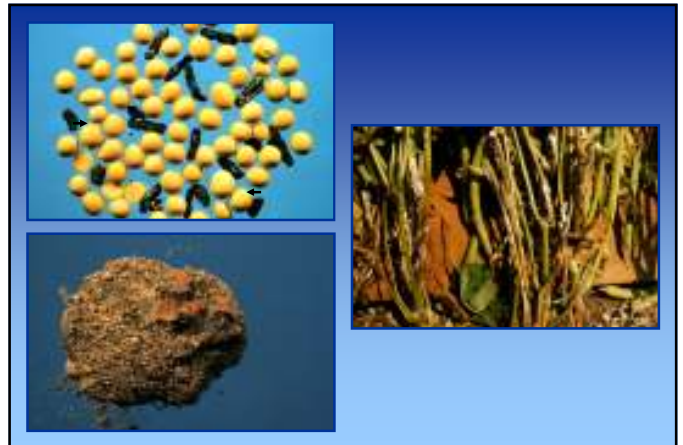


Common Diseases in the Vegetable Garden Cucumber Mosaic

- **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**



Common Diseases in the Vegetable Garden Root Rots

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

Common Diseases in the Vegetable Garden Bacterial Soft Rot

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



Common Diseases in the Vegetable Garden Bacterial Soft Rot

- **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)

Common Diseases in the Vegetable Garden Bean Leaf Diseases

- **Hosts**
 - Snap bean
 - Kidney bean
 - Lima bean
- **Environmental trigger: Driving rain (?)**



Common Diseases in the Vegetable Garden Bean Leaf Diseases

- **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
 - Streptomyces lydicus, Trichoderma spp., Gliocladium spp., Pseudomonas spp., Bacillus spp.
 - 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***