Garden Expo 2018

Diseases of Vegetables

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Diseases of Vegetables
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

Diseases of Vegetables
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

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" http://www.extension.org/pages/72678/late-blight-management-in-tomato-with-resistant-varieties#.VVNSsPlVhBd

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

Diseases of Vegetables
Powdery Mildew

- 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

Diseases of Vegetables
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

Diseases of Vegetables
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)

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 (?)

Diseases of Vegetables
Common Smut

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

Diseases of Vegetables
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)

Diseases of Vegetables
Common Scab

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

Diseases of Vegetables
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

Diseases of Vegetables
Walnut Toxicity

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



Diseases of Vegetables
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

Diseases of Vegetables
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 (?)

Diseases of Vegetables
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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