Outagamie County Seminar

Fruit and Vegetable Diseases to Watch for in 2016

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Fruit and Vegetable Diseases

Tomato 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

Fruit and Vegetable Diseases

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

• Control (early blight, Septoria leaf spot)
  – DO NOT overhead water
  – Remove infected leaf tissue (?)
  – Use fungicides to prevent infections
    • Chlorothalonil, copper, neem oil
    • Alternate active ingredients (FRAC codes)
    • Apply at 7-14 days intervals
**Fruit and Vegetable Diseases**

**Tomato 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**

- **Cause:** Calcium deficiency
  - **Hosts**
    - Tomato
    - Pepper
    - Eggplant
    - Cucurbits (cucumber, squash, pumpkin)
  - **Favorable environment:** Drought

- **Management**
  - Test soil to determine calcium level
  - Add calcium as needed
    - Bone meal
    - Egg shells
  - Water plants adequately

**Tomato Leaf Blights**

- **Control (late blight)**
  - Grow resistant tomato varieties
    - **Excellent:** 'Black Plum', 'Defiant', 'Iron Lady', 'Matt's Wild Cherry', 'Mountain Magic', 'Mountain Merit', 'Plum Regal', 'Yellow Currant', 'Yellow Pearl'
    - **Good:** 'Aunt Ginny's Purple', 'Big Rainbow', 'Red Currant', 'Tigerella'
    - **Moderate:** 'Aunt Ruby's German Green', 'Black Krim', 'Juliet', 'Pruden's Purple', 'Red Pearl', 'Slava', 'Stupice', 'Sun Sugar', 'Wapsipinicon', 'Wisconsin 55'

- **Use fungicides to prevent infections**
  - Chlorothalonil, copper
  - Apply at 7-14 day intervals
**Fruit and Vegetable Diseases**

**Powdery Mildew**

- **Causes**
  - *Sphaerotheca fuliginea*
  - *Erysiphe cichoracearum*
  - *Oidium spp.*

- **Hosts**
  - Cucurbits (cucumber, squash, pumpkin)
  - Other vegetables (and fruits)

- **Favorable environment**: High humidity

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**Fruit and Vegetable Diseases**

**Powdery Mildew**

- **Control**
  - Plant resistant varieties
  - DO NOT crowd plants
  - Thin vines
  - Apply fungicides for control
    - Elemental sulfur
    - 1.5 Tbsp baking soda + 3 Tbsp light-weight horticultural oil in 1 gal water
    - Apply at 7-14 day intervals

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**Fruit and Vegetable Diseases**

**Aster Yellows**

- **Cause**: Aster yellows phytoplasma
- **Hosts**
  - Carrot
  - Potato
  - Other vegetables

- **Favorable environment**
  - None in terms of weather
  - High aster leafhopper populations

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**Fruit and Vegetable Diseases**

**Aster Yellows**

- **Control**
  - Remove infected plants
  - Control leafhoppers (?)
Fruit and Vegetable Diseases
Herbicide Injury

• Causes
  – Growth regulator herbicides
    • 2,4-D
    • Dicamba
  – Other classes of herbicides

• Affected plants
  – All vegetables, particularly tomato

• Favorable Environment: High wind

Fruit and 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

Fruit and Vegetable Diseases
Common Smut

• Cause: Ustilago maydis

• Host: Corn

• Favorable environment: Hail

Fruit and Vegetable Diseases
Common Smut

• Control
  – Plant resistant varieties
  – Reduce physical damage to corn plants
  – Give up on your corn and eat the smut
**Fruit and Vegetable Diseases**

**Scab**
- **Cause:** *Streptomyces scabies*
- **Host**
  - Potato
  - Other root crops (carrot, radish, turnip)
- **Favorable environment:** High soil pH

**Control**
- Plant scab-free potato stock
- Routinely rotate crops to avoid build-up of the pathogen
  - Avoid planting potatoes in infested areas
  - Plant non-hosts in infested areas
- Move potatoes to another location
- Plant scab resistant varieties
- Lower soil pH

**White Mold**
- **Cause:** *Sclerotinia sclerotiorum*
- **Host**
  - Snap beans
  - Other vegetables
  - Sunflower
- **Favorable environment:** Cool, wet weather

**Control**
- Buy high quality seed
- Routinely rotate crops to avoid build-up of the pathogens
  - Avoid planting susceptible vegetables in infested areas (5-7 yrs)
  - Plant non-hosts in infested areas
- Control broad-leaf weeds
- Plant beans with wider row spacings
**Fruit and Vegetable Diseases**

**White Mold**

- **Control**
  - DO NOT over-water
  - DO NOT over-mulch
  - DO NOT over-fertilize
  - Remove symptomatic plants immediately
  - Use biological control products
    - Coniothyrium minitans
    - Parasitizes sclerotia

**Cucumber Mosaic**

- **Cause:** Cucumber mosaic virus
- **Hosts**
  - Cucurbits
  - Pepper
  - Tomato
- **Favorable environment**
  - None in terms of weather
  - High aphid populations

**Cucumber Mosaic**

- **Control**
  - Plant resistant/tolerant varieties
  - Plant based resistance
  - Plant based tolerance
  - Genetically modified plants
  - Attempt to control aphid vectors (?)
  - Attempt to eliminate alternate hosts (?)

**Scab (Apple and Pear)**

- **Cause:** Venturia inaequalis (V. pirina)
- **Hosts**
  - Apple
  - Crabapple
  - Pear
  - Mountain ash
- **Favorable environment:** Cool, wet weather
**Fruit and Vegetable Diseases**

**Scab (Apple and Pear)**

- **Control**
  - Plant resistant varieties
  - Remove and destroy diseased leaves
    - Burn (where allowed)
    - Deep bury
    - Hot compost
  - Thin trees to promote air flow

**Cause:** Gymnosporangium spp.

- **Hosts**
  - Junipers
  - Woody rosaceous plants
    (apple, crabapple, hawthorn, quince, pear!)
  - Favorable environment: Wet weather

**Cedar-Apple” Rusts**

- **Control**
  - Grow only the juniper or rosaceous host
  - Use resistant cultivars/varieties
  - Remove galls

- **Control**
  - Use fungicides to prevent infections
  - Chlorothalonil, copper, mancozeb, myclobutanil, propiconazole, thiophanate-methyl, sulfur
  - Alternate active ingredients (FRAC codes)
  - From bud break through the end of favorable weather
  - Apply at 7-14 day intervals

**Cedar-Apple” Rusts**

- **Control**
  - Use fungicides to prevent infections
  - Ferbam, triadimefon
  - Alternate active ingredients (FRAC codes)
  - Mid May through mid June (rosaceous hosts)
  - Early July through August (juniper hosts)
  - Apply at 7-21 day intervals
**Fruit and Vegetable Diseases**

**Black Knot**

- **Cause:** *Apiosporina morbosa*
- **Hosts**
  - Prunus species
  - Plums
  - Cherries
- **Favorable environment:** Wet weather

**Fire Blight**

- **Cause:** *Erwinia amylovora*
- **Hosts**
  - Many rosaceous plants
  - Apple, crabapple, pear, mountain ash, cotoneaster
- **Favorable environment**
  - Wet weather
  - Hail

**Control**

- DO NOT plant infected *Prunus* stock
- Buy black knot-resistant varieties if available (Prunus 'Accolade', Prunus sargentii, Prunus maackii)
- Remove volunteer plums/cherries
- Prune diseased branches
- DO NOT use fungicides

**Control**

- Plant resistant varieties where available
- Prune diseased branches
- Do not over-fertilize with nitrogen
- Use bactericides to prevent infections (?)
  - Copper-containing fungicides, antibiotics
  - During flowering
  - Applications every 7-14 days (3-4 days)
Fruit and Vegetable Diseases
Brown Rot

• **Causes**
  – *Monilinia fructicola*
  – *Monilinia laxa*
  – *Monilinia fructigena*

• **Hosts**
  – Stone fruits (apricot, cherry, peach, plum)
  – Apple

• **Environmental trigger:** Wet weather

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Fruit and Vegetable Diseases
Brown Rot

• **Control**
  – Remove mummified fruits
  – Prune out diseased/dead branches
  – Remove volunteer stone fruit trees/shrubs
  – Dispose of contaminated plant materials
    • Burning
    • Burying
    – Prune healthy branches to increase air flow

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Fruit and Vegetable Diseases
Peach Leaf Curl/Plum Pockets

• **Causes**
  – *Taphrina deformans*
  – *Taphrina communis*

• **Hosts**
  – Peach (peach leaf curl)
  – Plum (plum pockets)

• **Environmental trigger:** Wet weather

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Fruit and Vegetable Diseases
Brown Rot

• **Control**
  – Use fungicides to prevent infections
    • Captan, myclobutanil, propiconazole
    • Apply at 10% flower (flower infections)
    • Apply 3 weeks prior to harvest (fruit infections)
    • Alternate active ingredients (FRAC codes)
  – Manage insects that injure fruit

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Fruit and Vegetable Diseases
Brown Rot

• **Control**
  – Decontaminate pruning tools
    • 10% bleach
    • 70% alcohol
  – DO NOT overhead water
  – Carefully handle fruits at harvest
Fruit and Vegetable Diseases
Peach Leaf Curl/Plum Pockets

• Control
  – Remove/destroy symptomatic leaves/fruits
  – Burn
  – Bury
  – Hot compost
  – Prune/thin trees to improve air flow
  – Use fungicides to prevent infections
    • Chlorothalonil, copper, ferbam
    • Apply after leaf fall and/or before leaf emergence

Fruit and Vegetable Diseases
Root/Crown Rots

• Pathogens
  – *Pythium* spp.
  – *Phytophthora* spp.
  – *Rhizoctonia solani*
  – *Fusarium* spp.
  – *Cylindrocarpon* spp.
  – *Thielaviopsis* spp.

Fruit and Vegetable Diseases
Root/Crown Rots

• Hosts
  – Any fruit crop
  – Strawberry
  – Raspberry
  – Apple

• Favorable environment
  – High soil moisture
  – Cool soil temperatures

Fruit and Vegetable Diseases
Root/Crown Rots

• Control
  – Moderate soil moisture
    • Grow plants in well-drained sites
    • Use a soil with adequate drainage
    • Improve drainage in poorly drained soils
      – Add organic matter to improve drainage
      – Use raised beds
  • DO NOT overwater
  • DO NOT overmulch
**Fruit and Vegetable Diseases**

**Root/Crown Rots**

- **Control**
  - DO NOT move contaminated soil or plants to non-infested areas
  - Decontaminate infested tools, pots, work areas
  - Pretest soils/mulches/composts for the presence of root rot fungi

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**Fruit and Vegetable Diseases**

**White Pine Blister Rust**

- **Pathogen:** Cronartium ribicola
- **Hosts**
  - Gooseberry/Currants (Ribes spp.)
  - White pine
- **Favorable environment:** Wet weather

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**Fruit and Vegetable Diseases**

**White Pine Blister Rust**

- **Control**
  - Prune diseased branches
  - Prune healthy branches from the ground up
  - Disinfest pruning tools
    - 70% alcohol
    - 10% bleach
    - Commercial disinfectants
  - DO NOT use fungicides

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**Fruit and Vegetable Diseases**

**Root/Crown Rots**

- **Control**
  - Use fungicides to prevent infections
    - Etridiazole, metalaxyl, mefenoxam, fosetyl-Al, (PCNB, thiophanate-methyl, fludioxonil)
  - Use granular formulations if possible
  - Use during periods of wet weather

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Fruit and 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  
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