Insects and Diseases in the Garden

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Successful gardening

• Pesticides
• Pest prevention
• Pest identification and management
Pesticide use

- Pesticides are last resort
- One of many tools
Pesticide safety

• Exposure
• Re-entry or post-harvest interval
  – interval between the last pesticide application and reentry or harvest

READ THE LABEL.
IT IS THE LAW.
Control

- Identify pest
- Review control measures
- Use cultural control where possible
- Apply chemicals as last resort
  - Choose appropriate chemical
Pest prevention

• Choose disease-resistant varieties
Pest prevention

• Select healthy, disease-free plants
Pest prevention

• Mulch
  – Cover garden soil with a 2” layer of organic material (straw, bark mulch, etc.)

• Avoid wetting leaves
  – Drip irrigation / soaker hoses
  – Water early in the morning

• Don’t compost problem plants
Pest prevention

• Crop rotation
  – Strive for 3 years between crops in same family
Pest prevention

• Soil test
  – *Only* way to determine soil pH
  – Every 3 to 4 years
Pest prevention

• Lime early
  – Till it in
  – Can take months to change soil pH
  – Test at least a few months before planting
Pest prevention

• Cover crop
  – Suppress weeds
  – Organic matter
  – Nitrogen
  – Reduce erosion
  – Reduce disease
Early detection of pests may
- Reduce the spread of the pest
- Reduce the amount of pesticides used
- Reduce the cost of control
- Allow the use of natural enemies or other slow acting, less toxic pesticides
Pest management

• Identify problem
  – Fungus
  – Bacteria
  – Insect
  – Virus
  – Environment
Pest management

- Review control measures
- Use cultural control where possible
- Apply chemicals as last resort
  - Choose appropriate chemical
  - Avoid broad-spectrum insecticides
Alternative Pest Control

- Insecticidal soap
- Horticultural oil
- Beneficial fungi
- Beneficial bacteria
- Botanicals
Alternative pest control

• Insecticidal soap
  – aphids, whiteflies, mealybugs, and spider mites

• Horticultural oil
  – aphids, whiteflies, leafhoppers, and spider mites
Alternative pest control

- *Bacillus thuringiensis*
  - Fungus that only infects caterpillars
- *Beauveria bassiana*
  - Bacteria that only infects insects
- Spinosad
  - Soil organism
Pest management in the garden

Common problems and what to do about them
Pest management

- Blossom end rot
  - Disorder
  - Localized Calcium deficiency

- Adjust soil pH
- Mulch
- Maintain consistent moisture
Pest management

• Blossom end rot
  – Adjust soil pH (6-6.5 is ideal)
  – Maintain consistent soil moisture
  – Mulch
  – Avoid root damage
Pest management

• Early blight
  – *Alternaria solani*
  – Tomatoes, potatoes
Pest management

- Early blight
  - Resistant varieties
    - Mountain Fresh
    - Mountain Supreme
    - Plum Dandy
Pest management

- Management
  - Rotation
  - Sanitation
  - Mulch
  - Preventative fungicide
    - Rotate chlorothalonil and mancozeb every seven days beginning when symptoms are first noticed
Pest management

• Tomato hornworm
  – Up to 4” long
  – Quickly defoliate tomato plants
Pest management

• Tomato hornworm
  – Management options
    • Pick off
    • *Bt*
    • Spinosad
    • Other chemicals
  – Leave parasitized worms in garden
Pest management

• Squash bug
  – Back resembles a shield
  – Related to stinkbug
  – Eggs laid on leaf underside
Pest management

• Squash bug
  – Fertilize properly
  – Remove egg masses
  – Choose
    • Butternut
    • Royal Acorn
    • Sweet Cheese
  – Sanitation
Pest management

- Squash vine borer
  - Clearwing moth
  - Larval damage
Pest management

• Squash vine borer
  • Rapid wilting

• Excrement at base
  • Late May/ early June
Pest management

• Squash vine borer
  – Plant a trap crop (‘Hubbard’)
  – Bury a few nodes on each vine
  – Destroy squash plants after fruit set
  – Overwinters in soil, till in fall to expose cocoons
  – Deworm vines
Pest management

• Squash vine borer
  – Insecticides are only preventative
    • Apply just before vines start to run and again in late July / early August
    • Concentrate on base of plant
    • 4 applications at 7-day intervals
Pest management

• Cabbage worm complex
  – Several types of worms that affect plants in mustard family
    • Broccoli, cabbage, cauliflower, kale, etc.
  – Worse in fall than spring
Pest management

• Potato leafhopper
Pest management

- Potato leafhopper
  - Stippling
  - Browning on leaf edges
Pest management

• Potato leaf hopper
  – Management options
    • Manage weeds
    • Chemical options
      – Neem
      – Pyrethrum
      – Malathion
Pest management

• Aphids
  – Distorted foliage
  – Honeydew
    • Sticky, shiny coating
  – Sooty mold
  – Presence of ants
Pest management

Aphids

– Undersides of leaves
– Stems
– New growth
Pest management

• Aphids
  – Control options
    • Avoid over-fertilization
    • Hose off with water
    • Natural enemies
Pest management

• Aphids
  – Chemical options
    ■ Insecticidal soap
    ■ Horticultural oil
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