



MICHIGAN STATE  
UNIVERSITY

# A Pocket Guide to Common Diseases in the Urban Garden

Dr. Rachel P. Naegele  
Dr. Mary K. Hausbeck

2013



This guide is intended to serve as a portable reference to diagnose many common vegetable diseases. It does not contain every possible symptom or control strategy.

Each section covers a specific vegetable and has a brief description of what causes the disease, symptoms to look for, and possible management strategies. Whenever crop rotation is listed, please be sure to rotate to a different family (a list of families is included).

If you are unable to diagnose your disease based on this guide, a list of references (online and local) is included at the end to help you.

## Plant Families

### Solanaceae

*Tomato*

*Pepper*

*Eggplant*

*Potato*

### Cucurbitaceae

*Cucumber*

*Squash*

*Melon*

*Pumpkin*

### Fabaceae

*Snap bean*

*Dry bean*

*Pea*

*Cowpea*

### Brassicaceae

*Turnip*

*Broccoli*

*Cabbage*

*Cauliflower*

### Poaceae

*Sweet Corn*

*Popcorn*

*Rice*

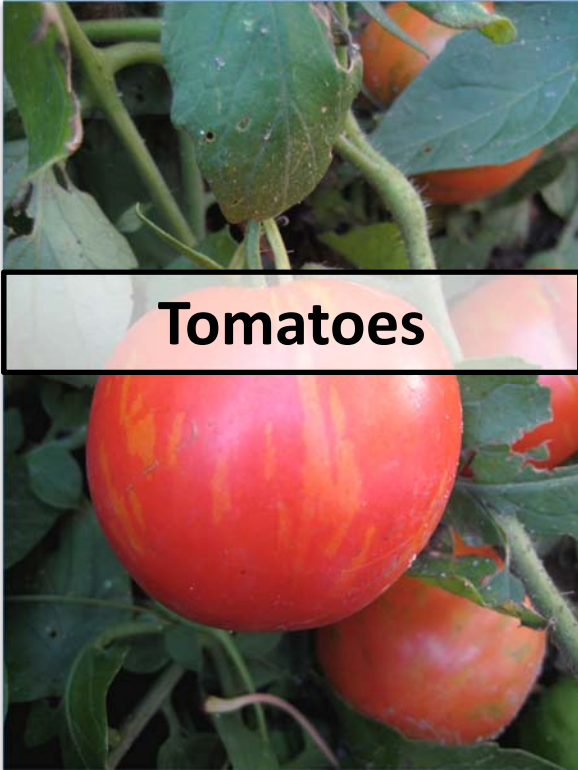
*Sorghum*

### Apiaceae

*Carrot*

*Celery*

*Parsnip*



## Late blight

Late blight is a disease caused by the water mold *Phytophthora infestans*. The pathogen is airborne and can overwinter in crop debris.

### Symptoms

Symptoms are irregular-shaped water-soaked lesions on stems or leaves and eventual necrosis (browning), and dieback. Greasy gray/brown lesions can appear on immature fruit.

### Management

- Resistant cultivars
- Black plastic mulch
- Remove and dispose of infected material
- Rotate crops
- Improve canopy airflow



## Early blight

Early blight is a fruit and foliar disease caused by the soilborne fungus *Alternaria solani*.

### Symptoms

Symptoms are a “bullseye” leaf spot (generally on mature leaves) and on ripe fruit, black lesions that eventually crack.

### Management

- Resistant cultivars
- Black plastic mulch
- Remove and dispose of infected material
- Stake plants
- Limit overhead irrigation



## Anthracnose

Anthracnose, caused by the pathogen *Colletotrichum*, is a fungal disease that causes a fruit rot on tomato, pepper and eggplants.

### Symptoms

Initial symptoms are small circular, water-soaked areas on ripe fruit. Eventually lesions becomes sunken and dark with a “bullseye” pattern.

### Management

- Stake plants
- Black plastic mulch
- Remove infected material
- Limit overhead irrigation
- Improve drainage
- Rotate crops



## Septoria leaf spot

*Septoria* is a fungal pathogen causing disease on foliar plant parts. It does not directly affect the fruit, but can reduce photosynthesis and yield.

### Symptoms

Symptoms are dark brown circular lesions with a tan/gray center on stem or leaves. Lesions often have a yellow, chlorotic halo. The disease can overwinter on crop debris.

### Management

- Stake plants
- Black plastic mulch
- Remove and dispose of infected material
- Limit overhead irrigation



## Blossom end rot

Blossom end rot is an abiotic or noninfectious disease of immature and mature fruit.

### Symptoms

Symptoms are dark lesions at the blossom end of the fruit. Lesions widen over time, but are restricted to the end of the fruit (i.e. will not spread over the whole fruit.)

### Management

- Improve irrigation and water availability
- Add low N, high phosphate fertilizer (or milk) to soil



## Walnut toxicity (juglone)

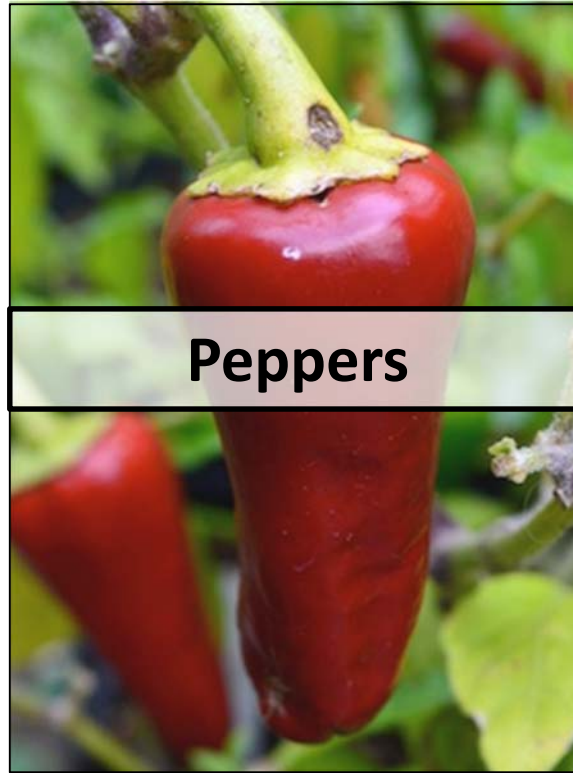
Juglone is a toxin produced by walnut trees. It is a noninfectious, abiotic disease.

### Symptoms

Symptoms of the disease are yellowing of the foliage, wilting and eventual death of susceptible plants. Tomatoes of all ages are affected. Symptoms of the fruit are browning on immature tomatoes.

### Management

- Plant tolerant species (melons, squashes, cucumbers and pumpkins are quite tolerant of juglone)
- Use raised beds with fresh soil
- Rake up plant debris



## Alternaria blight

Alternaria blight is caused by multiple species of the fungal pathogen *Alternaria*.

### Symptoms

Symptoms of the disease are foliar, either on the leaves or the fruit. Leaf symptoms are large lesions that have a “bullseye” like appearance. Fruit symptoms are dark lesions that become sunken. Often dark mycelia is visible on fruit lesions.

### Management

- Avoid damaging fruit
- Black plastic mulch
- Remove and dispose of infected material
- Stake plants
- Limit overhead irrigation



G. Holmes, Valent USA Corporation, Bugwood.org

## Tomato Spotted Wilt Virus

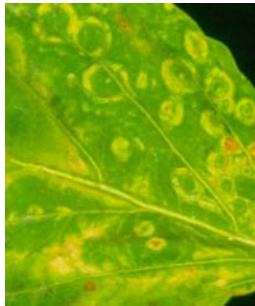
TSWV infects a wide range of solanaceous plants and is caused by a virus. The virus is spread through insects, sap and cuttings.

### Symptoms

Symptoms can occur on the fruit and the foliage. Leaves display a mottled or “spotted” appearance with bronzing and leaf death. Ringspots are commonly seen on leaves and occasionally on the fruit.

### Management

- Start with clean seeds
- Manage weeds
- Remove and dispose of infected material
- Manage insects, mainly aphids and thrips



## Cucumber Mosaic Virus

CMV infects a wide range of plants and is caused by a virus. The virus is spread by insects, sap and cuttings.

### Symptoms

On pepper, symptoms can occur on the fruit and the foliage. Leaves display a mottled or “mosaic” pattern with patches of light and dark green. Plants may also show stunting and irregular ripening.

### Management

- Remove weeds
- Use reflective mulches to repel insects.
- Remove and dispose of infected material
- Sanitize tools



**Eggplants**

## Verticillium wilt

This soilborne pathogen infects the roots of eggplants at any age. It has a wide host range, infecting many solanaceous crops. It can remain in the soil for up to 6 years.

### Symptoms

Early during infection, lower mature leaves begin to wilt. As the disease progresses, upper leaves and new growth begin to wilt, leading to eventual plant death. Black streaking is visible in the vascular tissue.

### Management

- Rotate crops
- Manage weeds
- Remove and destroy infected material
- Use raised beds with clean soil



## Alternaria fruit rot

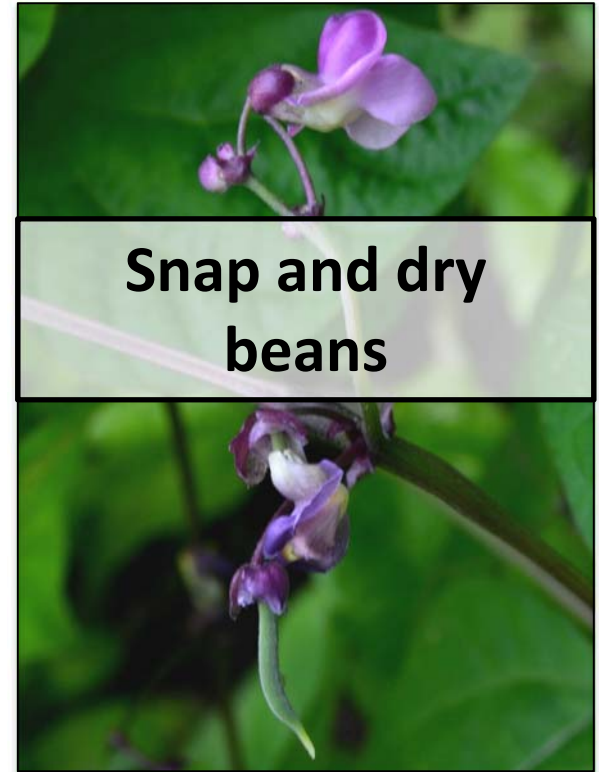
*Alternaria* sp. can cause fruit rot on many solanaceous species. This pathogen lives in the soil and is often splashed up onto fruit during rain or watering. Lesions form as the fruit matures.

### Symptoms

Fruit rot lesions are typically sunken and dark (black or brown) depending on the eggplant cultivar, and extend deep into the flesh. Lesions progressively grow and cover the fruit.

### Management

- Rotate crops
- Manage weeds
- Remove and destroy infected material
- Use plastic mulch



## White mold

White mold is caused by the fungus *Sclerotinia* that overwinters in the soil. Disease is favored by cool wet conditions.

### Symptoms

Wet pale-colored lesions are visible on the stem or leaves of the plant. Later lesions have a white moldy appearance. In severe cases, plants and pods can be affected.

### Management

- Black plastic mulch
- Remove and dispose of infected material
- Limit irrigation
- Crop rotation
- Improve spacing



Photo by W. Mkwaila



## Sweet corn and popcorn

## Smut

Smut is caused by a fungal pathogen and is common in hot dry weather. It predominantly affects ears, but can also affect tassels. It is also a delicacy in certain cuisines.

### Symptoms

Symptoms are enlarged grayish kernels on the ear. Advanced symptoms are dark powdery mycelia on the outside.

### Management

- Remove and dispose of infected material
- Limit irrigation on ears and tassels
- Crop rotation of at least 2 yrs



## Corn earworm

The corn earworm is an insect that feeds on tomato, corn and beans. The larval stage of the insect is the primary pest phase. Control is mainly through avoidance.

### Symptoms

The larval stage of the insect feeds on foliage, but primarily burrows into the young corn ears at the tip

### Management

- Plant early maturing cultivars
- Damage can be tolerated by cutting off the infected portion of the ear



F.B. Peairs, Colorado State University Bugwood.com

## Lettuce and Greens

## Bacterial soft rot

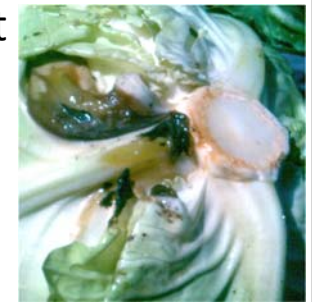
Multiple species of bacteria can cause bacterial soft rot on greens. They primarily attack soft and succulent portions of the plant.

### Symptoms

Symptoms start as small water-soaked lesions on the plant. As the disease progresses these lesions enlarge and deepen causing the plant tissue to become soft, watery and filled with bacteria.

### Management

- Improve soil drainage
- Remove diseased materials
- Crop rotation
- Use resistant cultivars





## Sclerotinia on lettuce

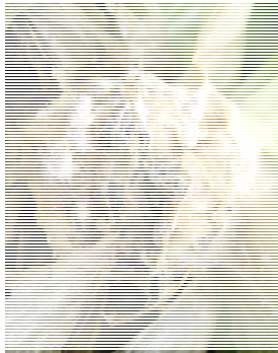
Sclerotinia rot is caused by the soilborne fungus *Sclerotinia*, and is favored by wet growing conditions.

### Symptoms

Symptoms can be seen on the leaves and roots of plants. A soft, wet rot forms and older leaves wilt. Advanced symptoms are completely wilted, soft, rotting plants.

### Management

- Reduce irrigation
- Use raised beds
- Remove diseased materials
- Crop rotation (3 years or more)



## Sclerotinia on cabbage

Sclerotinia rot is caused by the soilborne fungus *Sclerotinia*, and is favored by wet growing conditions. Allowing sufficient airflow between plants can reduce the disease severity.

### Symptoms

Symptoms are visible on the leaves and stems of plants near the soil line. Most often symptoms appear on the head of the cabbage.

### Management

- Reduce irrigation
- Use raised beds
- Remove diseased materials
- Crop rotation (3 years or more)



## Cercospora leaf spot

Cercospora leaf spot is caused by a fungal pathogen and is frequently seen on Swiss chard and beets late in the growing season.

### Symptoms

Symptoms are circular purple or brown spots with a pale middle on leaves and petioles. In severe cases spots can coalesce into large purple or brown lesions on the leaf.

### Management

- Improve plant spacing
- Use tolerant cultivars
- Remove diseased materials





## Cucumbers, melons, pumpkins and squashes



### Powdery mildew

Powdery mildew is a fungal disease that affects the leaves of most cucurbits often later in the growing season.

#### Symptoms

Symptoms are a superficial white powder on the upper and lower leaf surfaces. It does not affect the fruit directly, but can reduce photosynthesis, decreasing yields.

#### Management

- Increase plant spacing
- Remove infected material
- Limit overhead irrigation
- Foliar application of milk, baking soda or CocaCola®



Photo by Utmarketgardenproject.com

### Squash vine borer

The larval stage of the squash vine borer attacks cucumbers, melons and pumpkins. The pupae overwinter in the soil. In the spring adults lay eggs near base of plants.

#### Symptoms

Entry holes of the larvae are marked by wet sawdust-like frass. Plants will show severe wilt as the larvae (caterpillars) burrow into the main stem.

#### Management

- Crop rotation and tilling
- Plant resistant squashes (e.g. butternut vs. hubbard)
- Use trap crops



A.N. Sparks, Jr., University of GA, Bugwood.org

## Downy mildew

Downy mildew is caused by a fungal-like pathogen that affects the leaves of cucurbits, particularly cucumbers

### Symptoms

Symptoms are angular lesions on the leaves. The underside of the leaves have tiny gray or brown sporangia that look very similar to dirt.

### Management

- Increase plant spacing
- Remove infected material
- Limit overhead irrigation



Photo by Elizabeth Savory

## Blossom end rot

Blossom end rot is an abiotic or noninfectious disease of immature and mature fruit.

### Symptoms

Dark lesions occur at the blossom end of the fruit. Lesions widen over time, but are restricted to the end of the fruit (i.e. will not spread over the whole fruit.) Secondary invaders can result in fluffy growth on the ends.

### Management

- Improve irrigation
- Add low N, high phosphate fertilizer (or milk) to soil



## Phytophthora rot

Phytophthora rot is caused by the water mold *Phytophthora capsici*. Most cucurbit species are susceptible to this soilborne pathogen and no resistant cultivars are available.

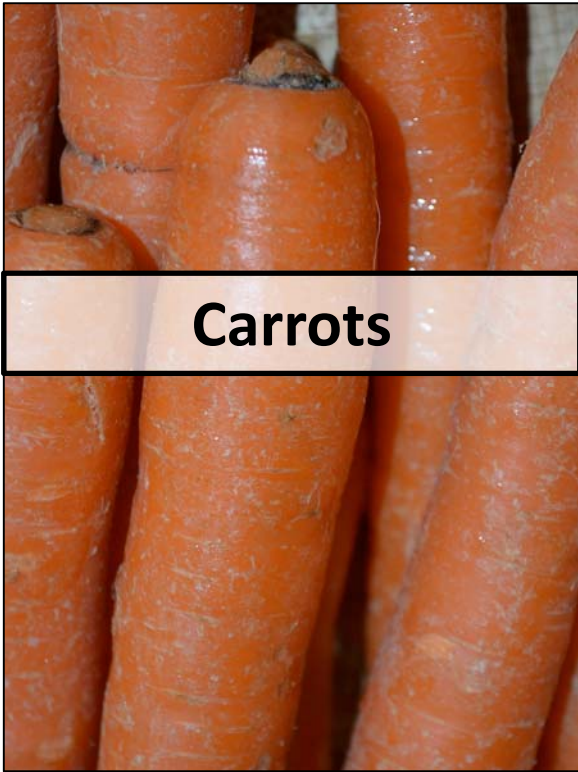
### Symptoms

For fruit, symptoms are small water-soaked lesions that develop white powdered sugar-like growth. For root rot, above ground symptoms are severe and irreversible wilting.

### Management

- Raised beds
- Mulch
- Remove infected material
- Limit overhead irrigation





## Carrots

### Cavity spot

Cavity spot is caused by the soilborne water mold *Pythium*. The disease is favored by cool, wet conditions

#### Symptoms

Symptoms are small elliptical shaped dark sunken lesions on the top half of a mature tap root. Lesions enlarge as the disease progresses.

#### Management

- Reduce irrigation
- Crop rotation (3 years or more)
- Resistant cultivars
- Carrots can still be consumed as lesions are primarily superficial



### Additional Resources

#### MSU Diagnostic Services

578 Wilson Rd., Rm. 107  
East Lansing, MI 48824-6469  
517-355-4536

#### MSU Diagnostic Pest Fact Sheets

[www.pestid.msu.edu](http://www.pestid.msu.edu)

#### MSU Extension News Digest

<http://msue.anr.msu.edu/topic/info/vegetables>

#### MSU Garden Hotline

1-888-678-3464

#### Vegetable MD online

[vegetablemdonline.ppath.cornell.edu/](http://vegetablemdonline.ppath.cornell.edu/)

Funding Provided By:

