Penn State Master Gardeners

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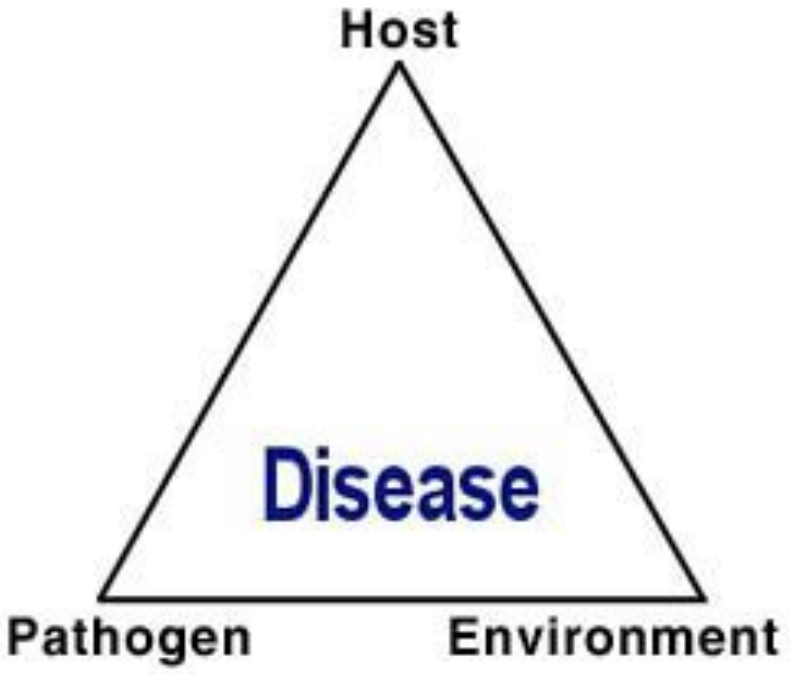
Plant Disease Around The Home Garden

Plant Disease Basics - The Disease Triangle

1. a susceptible host crop
2. the pathogen
3. an environment that is favorable for the pathogen.



(Francl, 2022)

What is IPM?

Integrated Pest Management is a science-based approach that combines a variety of techniques. By studying their life cycles and how pests interact with the environment, IPM professionals can manage pests with the most current methods to improve management, lower costs, and reduce risks to people and the environment.

IPM tools include:

- Alter surroundings
- Add beneficial insects/ organisms
- Grow plants that resist pests
- Disrupt development of pest
- Prevention of pest problem developing
- Disrupt insect behaviors
- Use pesticides

1 IDENTIFY/ MONITOR

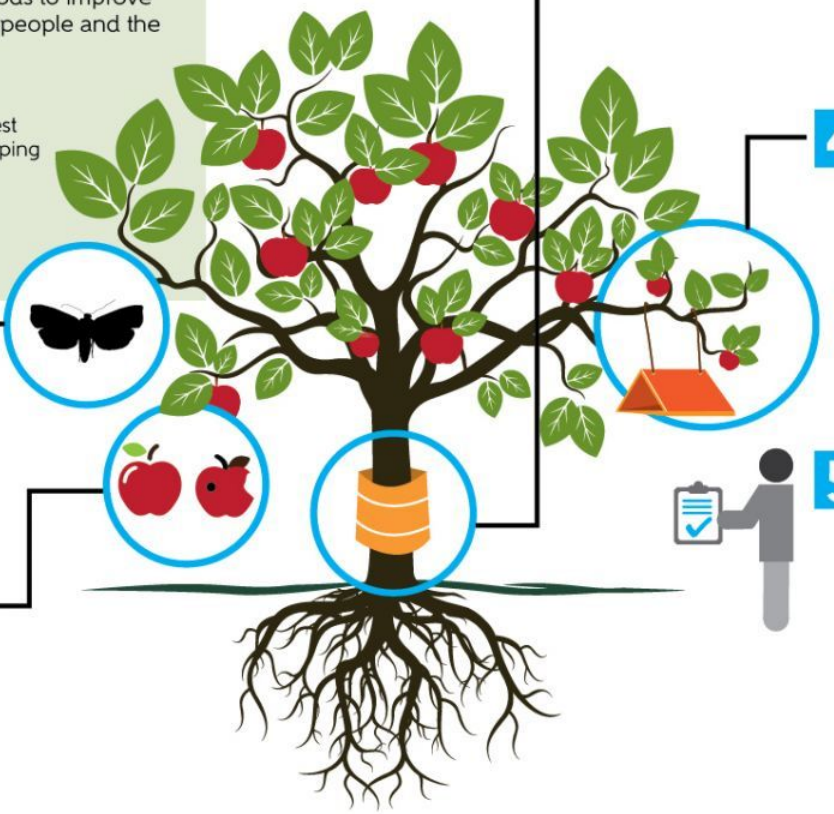
Determine the causal agent and its abundance (contact your local extension agent for help).

2 EVALUATE

The results from monitoring will help to answer the questions: Is the pest causing damage? Do we need to act? As pest numbers increase toward the economic threshold further treatments may be necessary.

3 PREVENT

Some pest problems can be prevented by using resistant plants, planting early, rotating crops, using barriers against climbing pests, sanitation, and sealing cracks in buildings.



4 ACTION

IPM uses multiple tools to reduce pests below an economically damaging level. A careful selection of preventive and curative treatments will reduce reliance on any one tactic and increase likelihood of success.

5 MONITOR

Continue to monitor the pest population. If it remains low or decreases, further treatments may not be necessary, but if it increases and exceeds the action threshold, another IPM tool should be used.

WHERE CAN YOU PRACTICE IPM?

Buildings and Homes:
Inspect, identify pests, keep pests out, clean to deny pests food and water, vacuum, trap, or use low-risk pesticides.

Farms:
Check for pests/pest damage regularly, identify accurately, choose pest-resistant plant varieties, encourage/introduce beneficial insects, time planting to avoid pests, and if needed use low-risk pesticides.

Managed Natural Systems:
Identify the pest and use management options that have minimal risks to pollinators, humans, and pets.

The Entomological Society of America is the largest organization in the world serving the needs of entomologists and other insect scientists. ESA stands as a resource for policymakers and the general public who seek to understand the importance and diversity of earth's most diverse life form—insects. Learn more at www.entsoc.org.

https://www.ipmcenters.org/about/what-is-ipm/

Turf Grass

Turf Grass- Brown patch

Caused by: a fungus called *Rhizoctonia solani*

Looks like: olive green to brown, roughly circular patches

Brown Patch, 2022

Turf Grass- Brown patch

Looks like: close inspection will show leaf lesions; most severe when night temperatures are above 70° F and day temps climb above 90° F and the blades are wet for long periods

Brown Patch, 2022

Turf Grass- Brown patch

What to do:

- Limit nitrogen application (no more than 0.5 lb. nitrogen/ 1,000 square ft)
- Get a soil test (adequate potassium & phosphorus)
- Reduce irrigation or limit it to early morning
- Use other methods to ensure turf stays dry
- Chemical control options available

Brown Patch, 2022

Turf Grass- Fairy ring

Caused by: mushroom forming fungi

Looks like: rings or arcs; mushrooms may appear after rains

Turf Grass- Fairy ring

What to do:

- Make sure the lawn has enough water
- Get a soil test
- Aeration to increase water and air penetration and encourage a stronger root system

These recommendations won't "cure" the turf but will make symptoms less noticeable and the lawn better able to resist infection

Turf Grass- Dollar spot

Caused by: a fungus (may be referred to as *Clarireedia homeocarpa* or *Sclerotinia homeocarpa*)

Looks like: silver dollar sized dead straw colored spots; grass blades have tan spots with reddish-brown borders

Turf Grass- Dollar spot

What to do:

- Select blends of grass varieties and species
- Get a soil test
- Water based on the need of the lawn early morning
- Eliminate thatch and use good aeration

Tomatoes

Tomatoes (and Potatoes)- Early blight

Caused by: a fungus Alternaria solani

Looks like: concentric rings or bullseye pattern, usually starting on the older leaves closest to the ground; area around the spot may later turn yellow; can spread to the stems and fruit with the same bullseye pattern

Early blight tomato leaf. Photo: Rebecca A. Melanson, Mississippi State University Extension, Bugwood.org.

Tomatoes (and Potatoes)- Early blight

What to do:

- Plant resistant tomato varieties
- Remove weeds and volunteer tomatoes
- Space tomato plants well apart
- Prune out infected leaves and branches, DISINFECT CLIPPERS with 1:9 bleach solution
- Skip planting tomatoes, peppers, potatoes and eggplant after years of very high disease or to plant them in a new area

Tomatoes (and Peppers)- Bacterial Spot

Caused by: f
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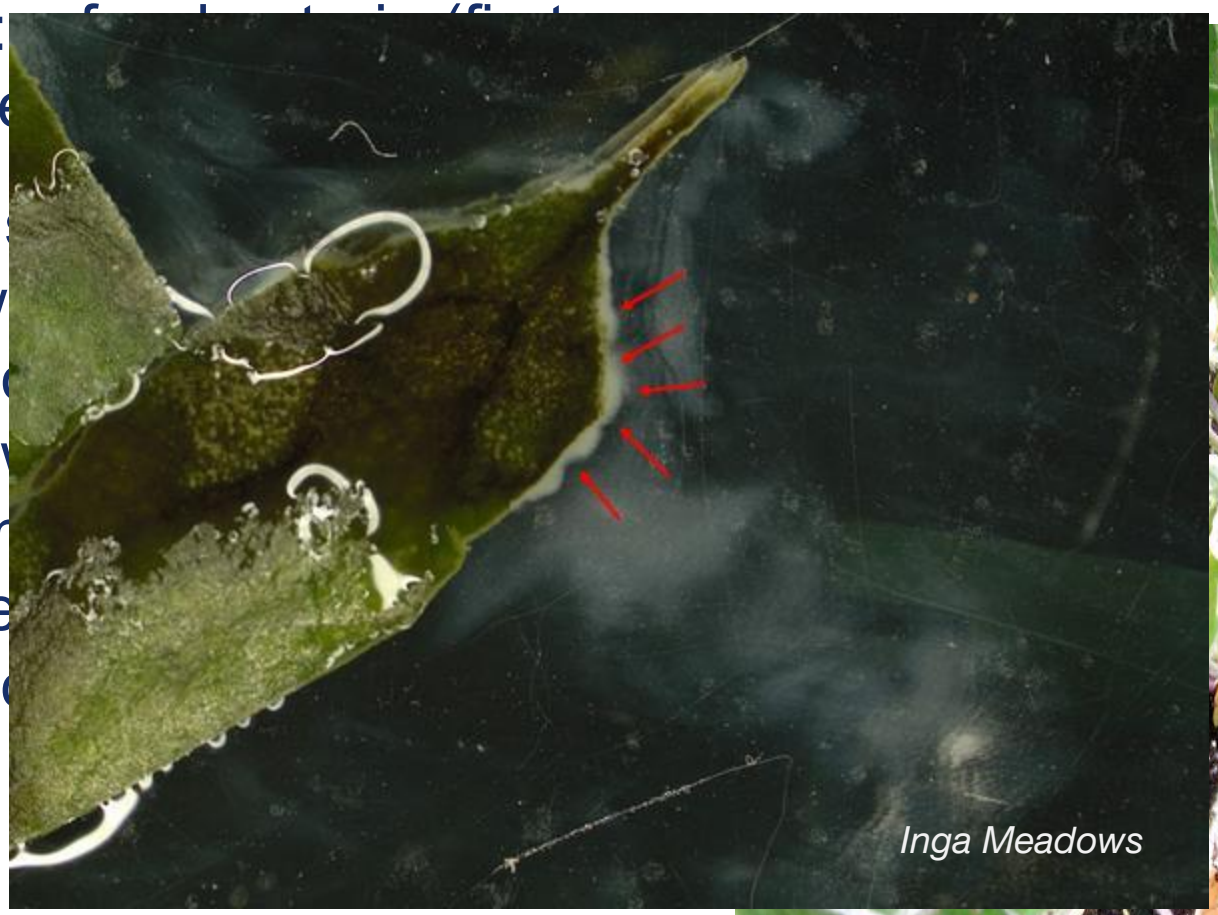


Tomatoes (and Peppers)- Bacterial Spot

What to do:

- Don’t handle or stake plants when they are
- Bacterial like warm wet conditions so watering in early morning
- Remove any related weed species from the garden
- Chemical/biological control options
- Skip a year or move your plantings to a new location after serious outbreaks

Irish Famine Memorial photo via Wikimedia/Creative Commons

Tomatoes (and Potatoes)- Late blight

Caused by: a fungal-like organism called *Phytophthora infestans*

Looks like: Pale green to brown spots on leaves, during high humidity and moisture can sometimes see white fluffy growth; greenish-brown spots on fruit that may appear greasy

Image by Cornell Horticulture Dept.

Tomatoes (and Potatoes)- Late blight

What to do:

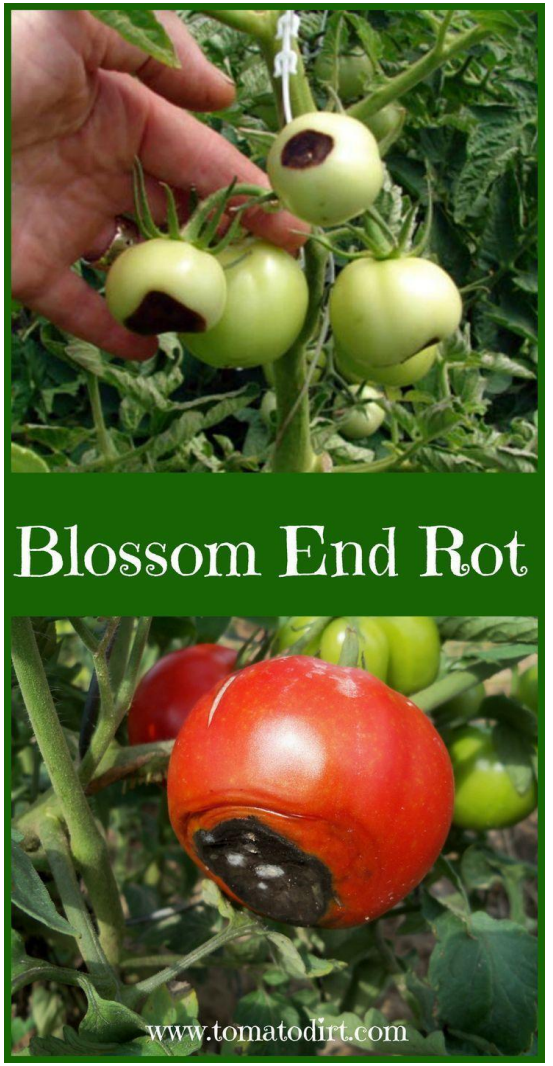
- Space tomato plants well apart
- Avoid planting tomatoes or potatoes in spots with history of disease and avoid planting them in low-lying Avoid overhead irrigation or water mid-morning
- Examine plants regularly and remove diseased tissue as soon a possible
- Prune out infected leaves and branches, DISINFECT CLIPPERS with 1:9 bleach solution

Tomatoes (sometimes other veggies) - Blossom-end rot

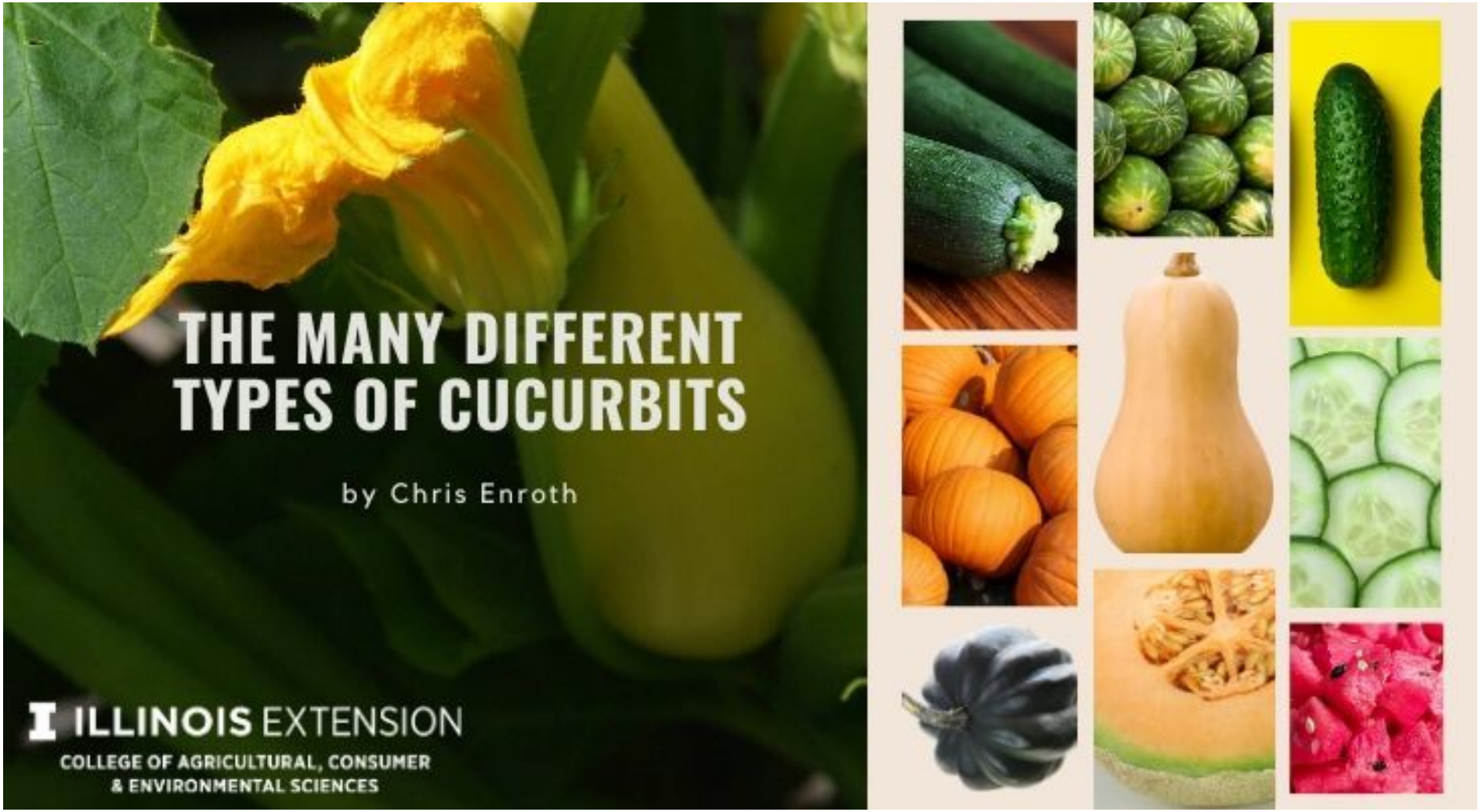
Caused by: Insufficient calcium in the tomato; not caused by a fungus or bacteria! Often occurs on the earliest tomatoes of the year

Looks like: Dry, sunken decay on the blossom-end

What to do: Moisture is important for calcium to move through the tomato plant, make sure to provide ~1 inch of water per week when there is no rain in the forecast. Water at the base of the plants to prevent other problems from occurring and mulch well to conserve that moisture. Use fertilizers that have lower nitrogen content. Remove impacted fruit so nutrients can be directed to other fruits. Get as soil test to determine the pH and nutrient requirements of your soil.



Cucurbits


THE MANY DIFFERENT TYPES OF CUCURBITS
by Chris Enroth
ILLINOIS EXTENSION
COLLEGE OF AGRICULTURAL, CONSUMER & ENVIRONMENTAL SCIENCES

Cucurbits (cucumbers pumpkins, squash, melons)- Powdery mildew

Caused by: fungi usually *Podosphaera xanthii* and *Erisyphe cichoracearu*m

Looks like: white powdery growth, looks like the leaves are covered in powdered sugar or baking powder

Cucurbits (cucumbers pumpkins, squash, melons)- Powdery mildew

What to do:

- Plant resistant varieties
- Place plants in a sunny area with good air circulation
- Don’t over fertilize plants.
- Apply insecticidal soaps

Cucurbits (cucumbers pumpkins, squash, melons)- Downy mildew

Caused by: fungus-like organism named *Pseudoperonospora cubensis*

Looks like: Begins as yellow angular lesions trapped by the veins in the leaves, this can lead to a mosaic appearance on the upper surface of the leaves, eventually these can turn brown; on the bottom of the leaves may see a dark brown to black fuzzy growth

Cucurbits (cucumbers pumpkins, squash, melons)- Downy mildew

What to do:

- Trellis plants to improve air circulation
- Remove plants with symptoms of disease.
- Check http://cdm.ipmpipe.org to see if cucurbit downy mildew has been spotted in your area, if not contact your local extension agent or Master Gardner; plant resistant varieties if possible

Various

Various - Aster yellows

Caused by: Phytoplasma (small bacterium), moved from plant to plant by leaf hoppers

Looks like: Veins that turn pale, yellowing of new leaves, abnormally bushy growth, deformed flowers, and stunting

Various - Aster yellows

What to do:

- Removing infected plants and weeds
- Always inspect new plants for symptoms
- Plant plants that are not susceptible
- Control of leafhoppers NOT effective

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