



IPM/Pollinators

Activity 3: Pathogen Patrol

In this "walk the beat" activity, students will develop an eye for the patterns of pathogenic symptoms and signs, and will learn the best ways to collect, package, and mail representative samples to a diagnostics lab.

KEY TERMS

Symptoms: Expressions from the plant, such as purpling, spots, bleaching, yellowing between the veins, discolored veins, wilting, twisting, puckering, lumps, bumps, holes, scapes, etc.

Signs: Physical pieces or impressions left by an afflicting organism, such as frass, shed skins, spores, bacterial streaming, foot prints, trail cam footage, etc.

Economic Threshold: The point at which taking an aggressive reaction against a pest makes the most economic sense.

Weather Model: Programs that read weather data and perform calculations that determine the risk of problems from organisms that cause problems in plants.

SUPPLIES NEEDED

READ (click or scan QR code)

- Identifying Vegetable Diseases (68 pages)



BRING

- Pictures of your own with or without explanation of the issue
- Boots
- Hat
- Sunscreen
- Rain gear
- Water
- Notebook
- Writing utensil



How do you do this?

PRE-CLASS

Step 1. Read the resource titled, Identifying Vegetable Diseases. This Penn State resource is a picture-heavy reference for the most common symptoms of vegetable pathogens that can be found in the Midwest and Great Lakes region.

Step 2. Come to session prepared to discuss observations of disease symptoms and signs on plants. Some pictures of disease symptoms and signs will be prepared for you, but please consider sharing any you may have as well.

IN-CLASS

Step 3. Go outside to observe crops. Together, practice describing the way symptoms or signs look and taking close up pictures.

Step 4. Observe how to fill out an MSU Plant & Pest Diagnostics lab form and package properly for shipping.

Step 5. Fill out the evaluation.

What does it mean for my farm?

This section is for understanding and discussing the observations with a fellow farmer or educator. What do the observations indicate? How can the results help to improve farming practices?

- What kinds of pathogens spread through air, water, soils, seeds, etc.?
- How can you improve your disease prevention?
- Are their symptoms on both sides of the leaf?
- Is there discoloration inside the stem?
- Is it a nutrient or insect issue instead?
- Is one wilting plant enough to justify a management action?
- Is it good to spray fungicides on a disease without knowing the disease?
- Some pathogen symptoms can look like feeding damage from an insect, and nutrient stresses. Bacterial infections can dry out leaf tissue and cause them to break through in ragged holes that can look a bit like insect feeding. The fruit disease called blossom end rot is actually a secondary infection of weakened tissue caused by a lack of calcium. The calcium issue is not usually due to a lack of calcium in the soil, but rather by the frequency and length of irrigation. Diseases with a broad host-range, like *Phytophthora* or *Sclerotinia*, can infect common weeds as well, and can build populations that later jump to crops.



Evaluation

1. Circle how much you would agree with the following statements

- **The material covered was relevant to the my interests and objectives.**

strongly disagree disagree neither agree nor disagree agree strongly agree

- **The facility was adequate for the educational sessions/hands-on field activities.**

strongly disagree disagree neither agree nor disagree agree strongly agree

- **The presenters clearly delivered the material and fielded audience concerns/questions.**

strongly disagree disagree neither agree nor disagree agree strongly agree

- **I learned useful material that I can implement on my operation.**

strongly disagree disagree neither agree nor disagree agree strongly agree

- **I have gained resources that will help me find solutions to crop management challenges.**

strongly disagree disagree neither agree nor disagree agree strongly agree



Evaluation

2. What did you like about the program?

3. What do you think can be improved about the program?