



Unit 1: Identification

Lesson Three: Plant Disease and Physiological Problem Identification

Created: 01/2018 by the National FFA Organization

STUDENT LEARNING OBJECTIVES:

After completing these activities students will...

1. Identify common diseases and physiological problems found in nursery/landscape plants.
2. Evaluate the cause and effect of diseases and physiological problems in nursery/landscape plants.
3. Discuss treatment and prevention strategies for diseases and physiological problems in nursery/landscape plants.

TIME REQUIRED: 60 Minutes

RESOURCES:

1. University of California – Pest Management Program, <http://ipm.ucanr.edu/PMG/diseases/diseaseslist.html>
2. University of Minnesota Extension, <https://www.extension.umn.edu/garden/yard-garden/trees-shrubs/cedar-apple-rust-and-gymnosporangium-rusts/>
3. University of Georgia Extension, <http://extension.uga.edu/publications/detail.cfm?number=B1238>

EQUIPMENT AND SUPPLIES NEEDED:

1. A copy of "Diseases Notes Sheet" for each student
2. Seven copies of "Physiological Problems Notes Sheet" for each student
3. A copy of "Physiological Problems" worksheet for each student
4. A copy of "Physiological Problems Presentation Guidelines" for each student
5. "Plant Diseases" PowerPoint
6. Internet access for each student group
7. Quizlet, <https://quizlet.com/216648720/nurserylandscape-diseases-and-physiological-problems-flash-cards/>

THESE ACTIVITIES ARE ALIGNED TO THE FOLLOWING STANDARDS:

FFA Precept

- FFA.PL-A.Action: Assume responsibility and take the necessary steps to achieve the desired results, no matter what the goal or task at hand.
- FFA.PL-B.Relationship: Build relationships, work as a team player and appreciate the talents of others.
- FFA.PL-C.Vision: Visualize the future and how to get there.
- FFA.PL-D.Character: Conduct oneself appropriately in relation to others regardless of the situation.
- FFA.PL-E.Awareness: Understand personal vision, mission and goals.
- FFA.PG-J.Mental Growth: Embrace cognitive and intellectual development relative to reasoning, thinking and coping.
- FFA.CS-M.Communication: Effectively interact with others in personal and professional settings.
- FFA.CS-N.Decision Making: Analyze a situation and execute an appropriate course of action.

Common Core- Reading: Informational Text

- CCSS.ELA-Literacy.RI.9-10.1 Cite strong and thorough textual evidence to support analysis of what the text says explicitly as well as inferences drawn from the text.

Common Core- Speaking and Listening

- CCSS.ELA-Literacy.SL.9-10.4 Present information, findings, and supporting evidence clearly, concisely, and logically such that listeners can follow the line of reasoning and the organization, development, substance, and style are appropriate to purpose, audience, and task.

Common Core- Literacy in Science & Technical Subjects: Writing

- CCSS.ELA-Literacy.WHST.9-10.2 Write informative/explanatory texts, including the narration of historical events, scientific procedures/experiments, or technical processes.
- CCSS.ELA-Literacy.WHST.9-10.2.a Introduce a topic and organize ideas, concepts, and information to make important connections and distinctions; include formatting (e.g., headings), graphics (e.g., figures, tables), and multimedia when useful to aiding comprehension.

- CCSS.ELA-Literacy.WHST.9-10.4 Produce clear and coherent writing in which the development, organization, and style are appropriate to task, purpose, and audience.
- CCSS.ELA-Literacy.WHST.9-10.7 Conduct short as well as more sustained research projects to answer a question (including a self-generated question) or solve a problem; narrow or broaden the inquiry when appropriate; synthesize multiple sources on the subject, demonstrating understanding of the subject under investigation.
- CCSS.ELA-Literacy.WHST.9-10.8 Gather relevant information from multiple authoritative print and digital sources, using advanced searches effectively; assess the usefulness of each source in answering the research question; integrate information into the text selectively to maintain the flow of ideas, avoiding plagiarism and following a standard format for citation.
- CCSS.ELA-Literacy.WHST.9-10.9 Draw evidence from informational texts to support analysis, reflection, and research

AFNR Career Ready Practices

- CRP.02. Apply appropriate academic and technical skills. Career-ready individuals readily access and use the knowledge and skills acquired through experience and education to be more productive.
- CRP.04. Communicate clearly, effectively, and with reason. Career-ready individuals communicate thoughts, ideas and action plans with clarity, whether using written, verbal and/or visual methods.
- CRP.05. Consider the environmental, social and economic impact of decisions. Career-ready individuals understand the interrelated nature of their actions and regularly make decisions that positively impact and/or mitigate negative impact on other people, organizations and the environment.
- CRP.06. Demonstrate creativity and innovation. Career-ready individuals regularly think of ideas that solve problems in new and different ways, and they contribute those ideas in a useful and productive manner to improve their organization.
- CRP.07. Employ valid and reliable research strategies. Career-ready individuals are discerning in accepting and using new information to make decisions, change practices or inform strategies.
- CRP.08. Utilize critical thinking to make sense of problems and persevere in solving them. Career-ready individuals readily recognize problems in the workplace, understand the nature of the problem, and devise effective plans to solve the problem.
- CRP.11 Use technology to enhance productivity. Career-ready individuals find and maximize the productive value of existing and new technology to accomplish workplace tasks and solve workplace problems.

Partnership for 21st Century Skills

- Collaboration
- Communication
- Environmental Literacy
- Information Literacy
- Initiative and Self-direction
- Productivity and Accountability
- Think Creatively

LESSON PLAN:

1. *Introduction*

Start the following conversation with students: *Bacteria and viruses cause diseases in humans and make us sick. We all have experienced being sick at least once, whether it was a common cold or a stomach bug. How can you tell if another person is sick?*

For the introduction activity, first have students think about the type of symptoms they look for to identify sickness. Encourage students to refer to personal experiences when they or someone they know has been sick. Have them pair up with a partner and share their thoughts.

Because plants are living things, we share some very basic characteristics with them, but what about when it comes to diseases? How do you think you can tell if a plant is sick?

Have them think about how a disease affects a plant. You cannot ask a plant what is wrong or take its temperature, so how do you tell? Encourage students to visualize a healthy plant, and then think about what the opposite of that would look like. Have them pair up with a partner and share their thoughts.

Disease can affect all living things, and if not treated, it can severely harm the health of the human, animal or plant. In this lesson, we will identify several common plant diseases, learn how it affects the plant, learn associated symptoms, and how to prevent and treat the disease.

2. *Activity*

Each student needs a copy of the "Disease Notes Sheet." They will follow along with the "Plant Diseases" PowerPoint and take notes. The PowerPoint will provide an overview and the symptoms, prevention and treatment for plant diseases in the nursery/landscape industry.

After the class has learned about the diseases, split the class into seven groups of equal size. Each group will have a different physiological problem to research (list included). As they conduct their research, they will complete the "Physiological Problems" worksheet.

Physiological Problems:

- Frost/Freeze Injury
- Iron Deficiency
- Leaf Scorch (drought/winter burn)
- Nitrogen Deficiency
- Pot-Bound Roots
- String Trimmer Injury
- 2,4-D Injury

Upon completing their research, each group will create a visual aid to showcase their physiological problem and aid in their presentation. This could be a PowerPoint, Prezi, poster or another visual aid. Each group member must participate in the presentation, which should be three to five minutes in length.

While each group is presenting, the other students will record their information on their "Physiological Problems Notes Sheet." Each student will need seven copies of this sheet. Utilize the included rubric to grade each presentation.

3. *Reflection*

Students can utilize the Quizlet flash cards to review the diseases and physiological problems learned in this lesson. They can do this themselves or quiz others within a group. As they identify each disease or physiological problem based off the displayed symptoms, have the students also determine how they would treat the plant in its present condition.

<https://quizlet.com/216648720/nurserylandscape-diseases-and-physiological-problems-flash-cards/>

4. *Leveling Up:*

To take this lesson one step further, have students work in groups to create an integrated pest management program for a specific disease or physiological problem.

NAME: _____

Diseases Notes Sheet

DIRECTIONS

Record notes about diseases from the PowerPoint presentation.

Disease: _____



Treatment



Disease: _____



Treatment



NAME: _____

Disease: _____



Disease: _____



NAME: _____

Disease: _____



Disease: _____



NAME: _____

Disease: _____



Disease: _____



NAME: _____

Disease: _____



Treatment



Disease: _____



Treatment



NAME: _____

Physiological Problems Notes Sheet

DIRECTIONS

Record the information presented by classmates in the following areas.

PROBLEM: _____

Draw a diagram to show the problem.

Causes

Symptoms

Treatment

Prevention

NAME: _____

Aligned to the following standards:

FFA.PL-A; FFA.PL-B, FFA.PL-C; FFA.PL-D; FFA.PL-E; FFA.PG-J; FFA.CS-M;
FFA.CS-N; CCSS.RI.9-10.1; CCSS.SL.9-10.4; CCSS.WHST.9-10.2;
CCSS.WHST.9-10.2.a; CCSS.WHST.9-10.4; CCSS.WHST.9-10.7;
CCSS.WHST.9-10.8; CCSS.WHST.9-10.9; CRP.02; CRP.04; CRP.05; CRP.06;
CRP.07; CRP.08; CRP.11;

Physiological Problems

DIRECTIONS

Research each area for your given physiological problem. Please be sure to cite your sources in the references section.

Causes

Find four or more facts describing in detail what causes this problem.

1. _____

2. _____

3. _____

4. _____

Symptoms

Find four or more descriptions of the physiological problem. Make sure to have reliable sources to back up the descriptions. Also, find two or more pictures showing the problems.

1. _____

2. _____

3. _____

4. _____

NAME: _____

Treatment

Find four or more facts about how to treat the problem.

1. _____

2. _____

3. _____

4. _____

Prevention

Find four or more ways to prevent the issue.

1. _____

2. _____

3. _____

4. _____

NAME: _____

Visual Aid

Complete each section of the checklist to ensure quality visual aids.

- ☐ 1. Contains all points from the "Causes" section.
- ☐ 2. Contains all points from the "Symptoms" section.
- ☐ 3. All text and pictures are easy to view and read from anywhere in the room.
- ☐ 4. Proofread all visual aids for spelling errors.

References

Use the area below to record the sources for all facts, descriptions and pictures. Make sure the sources are included in your visual aid.

1. _____

2. _____

3. _____

4. _____

5. _____

6. _____

7. _____

8. _____

NAME: _____

Physiological Problems Presentation Rubric

DIRECTIONS

Use this rubric to understand what should be covered during the presentation.

Causes

10-9	8-6	5-3	2-0	Score
Has four or more facts describing in detail how the problem is caused	Has three facts describing mostly how the problem is caused	Has two facts describing somewhat how the problem is caused	Has one or no facts describing in vague detail how the problem is caused	

Symptoms

10-9	8-6	5-3	2-0	Score
Describes four or more ways to identify the problem affecting the plant	Describes three ways to identify the problem affecting the plant	Describes two ways to identify the problem affecting the plant	Describes one or no ways to identify the problem affecting the plant	
Contains two or more pictures of the symptoms with sources	Contains two pictures of the symptoms with sources	Contains one picture of the symptoms and/or sources are not complete.	Has no pictures of the symptoms or no sources for pictures	

Treatment

10-9	8-6	5-3	2-0	Score
Has four or more facts describing in detail how to treat the problem	Has three facts describing mostly how to treat the problem	Has two facts describing somewhat how to treat the problem	Has one or no facts describing in vague detail how to treat the problem	

Prevention

10-9	8-6	5-3	2-0	Score
Provides four or more different ways to help prevent these physiological problems	Provides two different ways to help prevent these physiological problems	Provides one way to help prevent these physiological problems	Does not provide a way to help prevent these physiological problems	
or Clearly explains why prevention is not possible	or Explains why prevention is not possible	or Somewhat explains why prevention is not possible	or Does not explain why prevention is not possible	

NAME: _____

Visual Aid

5	4-3	2-1	0	Score
Visual aid contains all information that should be recorded by classmates	Visual aid contains most of the information that should be recorded by classmates	Visual aid contains some of the information that should be recorded by classmates	Visual aid contains none of the information that should be recorded by classmates.	
Is easy to read from anywhere in the room	Is easy to read from most of the room	Is somewhat difficult to read from anywhere in the room	No visual aid or is not readable from anywhere in the classroom	
Has no spelling errors	Has one or two spelling errors	Has more than three spelling errors	Has more than three spelling errors	

References

5	4-3	2-1	0	Score
Has sources that back up all claims	Has sources that back up most claims	Has sources that back up some claims	Does not have sources to back up claims	
Are from a respected establishment	Are from respected establishments	Are from somewhat questionable establishments	Are from unreliable establishments	
Properly displays all resources on the visual aid	Properly displays all resources on the visual aid	Displays resources on visual aid but are not correctly formatted	Does not display resources on the visual aid	