



Unit 2:

Plant Disease and Pest Management

Lesson Three: Insects and Pests

Created: 05/2017 by the National FFA Organization

STUDENT LEARNING OBJECTIVES:

After completing these activities students will...

1. Identify common insects and pests found in floriculture plants.
2. Evaluate the causes and effects of insects and pests in floriculture plants.
3. Discuss pest management strategies for floriculture plants.

TIME REQUIRED:

Varies based on teaching method:

- Direct instruction learning — 55 minutes
- Cooperative learning — 60-90 minutes
- Individualized learning — 120+ minutes

RESOURCES:

1. University of California
 - <http://ipm.ucanr.edu/PMG/C302/m302splfhpreenemy.html>
 - <http://ipm.ucanr.edu/PMG/GARDEN/PLANTS/INVERT/mealybugs.html>
 - <http://ipm.ucanr.edu/PMG/GARDEN/VEGES/PESTS/leafhopper.html>
 - <http://ipm.ucanr.edu/PMG/PESTNOTES/pn7401.html>
 - <http://ipm.ucanr.edu/PMG/PESTNOTES/pn7404.html>
 - <http://ipm.ucanr.edu/PMG/PESTNOTES/pn7405.html>
 - <http://ipm.ucanr.edu/PMG/PESTNOTES/pn7408.html>
 - <http://ipm.ucanr.edu/PMG/PESTNOTES/pn7427.html>
 - <http://ipm.ucanr.edu/PMG/PESTNOTES/pn7429.html>
 - <http://ipm.ucanr.edu/PMG/PESTNOTES/pn7448.html>
 - <http://ipm.ucanr.edu/PMG/r280300911.html>
 - <http://ipm.ucanr.edu/PMG/r280301111.html>

EQUIPMENT AND SUPPLIES NEEDED:

Direct Instruction Learning:

1. "Insects and Pests" PowerPoint
2. A copy of the "Information Chart" worksheet for each student

Cooperative Learning:

1. Internet access to research topics (per group)
2. Materials to create posters/brochures
3. A copy of the "Profile Worksheet" for each student
4. A copy of the "Product Rubric (Group)" worksheet for each group
5. A copy of the "Information Chart" worksheet for each student

Individualized Learning:

1. Internet access to research topics (per student)
2. Materials to create PowerPoint/podcast/posters
3. A copy of the "Profile Worksheet" for each student
4. A copy of the "Product Rubric (Individual)" worksheet for each student
5. A copy of the "Information Chart" worksheet for each student

PREVIOUS KNOWLEDGE RECOMMENDED FOR THIS LESSON:

- Plant anatomy and physiology

THESE ACTIVITIES ARE ALIGNED TO THE FOLLOWING STANDARDS:

FFA Precept

- 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.

NASDCTec

- AGPB01.01 Produce and manage plants in both domesticated and natural environments using application of principles of anatomy and physiology to enhance plant production.
- AGPB01.03 Examine and apply fundamentals of production and harvesting when producing plants to demonstrate plant management and production techniques.

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

Common Core- Math Practices

- CCSS.MP3: Construct viable arguments and critique the reasoning of others.

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* (suggested time 10-15 minutes) **If using the direct instruction method, refer to slides 1 and 2 of the "Insects and Pests" PowerPoint to present lesson objectives and do the introduction activity.**

What is a pest? Does it have to have an antenna or six legs or wings? What constitutes something as a pest? Maybe your family has dealt with pest issues before. How would you define a pest? Let's share our thoughts and come up with a classroom definition for the term pest.

Pest is a very broad term. Merriam-Webster defines a pest as "an animal or insect that causes problems for people especially by damaging crops; a person who bothers or annoys other people." By that definition, it can be anything from a younger sibling to a caterpillar. As a class, define pest and see how broad the definition is. Write the class definition on a white board or flip chart and list some student-generated examples of pests. Generalization is okay.

Pests are obviously an issue whether they are in the home or in the garden. Today, we are going to look at a specific group of pests that are commonly found in the floriculture industry. In this lesson, we will learn about several common insects and pests, how they affect plants, their associated symptoms and how to manage them.

2. **Instruction** (suggested time depends on teaching method) **Select a teaching method based on your number of students, time frame and available resources. For an overview of the teaching methods in this lesson, review the "Teaching Methods" worksheet. All methods will cover the same information.**

DIRECT INSTRUCTION LEARNING

Refer to slides 3-36 of the "Insects and Pests" PowerPoint to address the insects, pests and mites identified in the floriculture CDE.

The teacher will identify the 11 items classified as insects, pests and mites by the floriculture CDE. Each pest topic is presented with an overview, symptoms, prevention, treatment, an image and resources. Students should record and categorize the information using the "Information Chart" worksheet throughout the lesson. The "Information Chart" can be turned in as a daily grade and/or formative assessment, but it should be returned to students because it will be used throughout unit two.

COOPERATIVE LEARNING

The teacher will divide the class into 11 groups and assign each group a pest topic. Once assigned, each group will need at least one internet capable device and a "Profile Worksheet" to help them navigate and organize their research. Once they believe they have found enough information on their topic, the teacher should review their "Profile Worksheet" for accuracy and credibility. If finding information and credible sources is an issue, refer to the resources listed on this lesson plan.

After the research has been approved, the groups will begin to design their product. Depending on materials available, students can create a poster, infographic, brochure, etc., to display what they have learned. Once the product is finished, station the products around the room and give each student an "Information Chart." Allow students to rotate around the stations and view their peers' products while using them to fill in their chart.

Using the "Product Rubric," the teacher can grade each group themselves or make multiple copies and have the students grade each product during the rotation. Rubrics can be collected and used as a project grade. The "Information Chart" can be turned in as a daily grade and/or formative assessment, but it should be returned to students because it will be used throughout unit two.

INDIVIDUAL LEARNING

Each student will be assigned one of the 11 pest topics. Once assigned, each student will need an internet capable device and a "Profile Worksheet" to help them navigate and organize their research. Once they believe they have found enough information on their topic, the teacher should review their "Profile Worksheet" for accuracy and credibility. If finding information and credible sources is an issue, refer to the resources listed on this lesson plan or in the "Insects and Pests" PowerPoint.

After the research has been approved, the students will begin to design their product. Depending on materials available, students can create an informative essay, PowerPoint, podcast, etc., to display what they have learned. Once the product is finished, have each student present his or her product to the class. During the presentation, give students the "Information Chart" worksheet, and have them fill in their chart using the information being presented. The "Information Chart" can be turned in as a daily grade and/or formative assessment, but it should be returned to students because it will be used throughout unit two.

3. **Reflection** (suggested time 10-15 minutes) **If using the direct instruction method, refer to slide 37 of the "Insects and Pests" PowerPoint to present the reflection activity.**

That was a lot of pests, but did you notice any similarities in the prevention techniques? Some of the prevention techniques we reviewed might seem kind of obvious and just best practices for plant production. Review the pests and diseases we covered and pick three prevention techniques you would suggest to someone in the floriculture industry.

Have students think about what three prevention techniques they would suggest as something to practice for good plant production (beyond techniques used only in the case of an infestation). Have students pair up with a partner and share their choices.

Out of the techniques you and your partner discussed, would practicing them help with the prevention of any of the disorders or disease we discussed in previous lessons?

Allow students time to discuss how a prevention technique could help save the plants from other disorders and diseases mentioned earlier in the unit. Encourage them to use their "Information Chart" to refresh their memories. After they have finished discussing the topic, have each group share one of its prevention techniques and explain what pests, disease and/or disorders it could prevent.

4. **Leveling Up:** For students who finish early or want to practice the identification activity in the floriculture CDE.
 - a. If you have access to live specimens, bring in examples for students to see and quiz their ability to identify pests. Quiz them using the "Practicum Disorder Score Card" found in the [Floriculture CDE Handbook](#).
 - b. If you have internet access, have students use the identification cards on the [National FFA Quizlet](#) page to practice identifying disorders.
 - c. If you do not have internet access, create a set of flash cards using the slides of this PowerPoint, so students can practice identifying disorders.