

Course	Agricultural Science II
Unit	Plant Science
Lesson	Weeds, Diseases, Insects
Estimated Time	50 minutes
Student Outcome	

The student will be able to describe how pests affect plant growth.

Learning Objectives

1. Identify the pests which cause problems with plants.
2. Explain how weeds affect plant growth.
3. Explain how diseases affect plant growth.
4. Identify the three conditions that must be present for a disease to develop.
5. Explain how insects inhibit plant growth.

Grade Level Expectations

SC/LO/2/B/09-11/c

Resources, Supplies & Equipment, and Supplemental Information

Resources

1. *Plant Science* (Student Reference). University of Missouri-Columbia: Instructional Materials Laboratory, 1991.
2. *Plant Science Curriculum Enhancement*. University of Missouri-Columbia: Instructional Materials Laboratory, 2003.

Supplies & Equipment

- ☐ Plants injured by insects
- ☐ Leaves or a branch that is infested with aphids

Supplemental Information

1. Internet Sites
 - ☐ Crops Publications: Weed Control and Other Crops. University of Missouri Extension. Accessed January 22, 2008, from <http://extension.missouri.edu/explore/agguides/crops/#Other>.
 - ☐ Insects and Diseases Publications: Livestock and Crops. University of Missouri Extension. Accessed January 22, 2008, from <http://extension.missouri.edu/explore/agguides/pests/#Livestock>.
 - ☐ Integrated Crop Management Newsletter: Indices of Past Issues on Crop Production. Iowa State University Extension. Accessed January 22, 2008, from <http://www.ipm.iastate.edu/ipm/icm/indices/cropproduction.html>.
 - ☐ Plant Pest Identification Aid. Vegetable IPM, Departments of Entomology and Horticultural Sciences, Texas A&M University. Accessed January 22, 2008, from <http://vegipm.tamu.edu/imageindex.html>.

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- ❑ Weed ID Guide. Weed Science Program, College of Agriculture, Food and Natural Resources, University of Missouri. Accessed January 22, 2008, from <http://weedid.missouri.edu/>.
2. Print
- ❑ Greenwood, P., A. Halstead, A. R. Chase, and D. Gilrein. *American Horticultural Society Pests and Diseases: The Complete Guide to Preventing, Identifying, and Treating Plant Problems*. New York: Dorling Kindersly Publishing, Inc., 2000.
 - ❑ Parker, R. *Introduction to Plant Science*, rev. ed. Clifton Park, NY: Delmar Learning, 2003.
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Interest Approach

Bring into class several examples of plants injured by insects. Find some leaves or a branch that is infested with aphids, and discuss why the insects are on the plant. Relate this to the millions of dollars spent every year to control pests in food and fiber crops.

Communicate the Learning Objectives

1. Identify the pests which cause problems with plants.
2. Explain how weeds affect plant growth.
3. Explain how diseases affect plant growth.
4. Identify the three conditions that must be present for a disease to develop.
5. Explain how insects inhibit plant growth.

Instructor Directions	Content Outline
Objective 1 <i>For as long as humans have been growing plants for food, pests have caused problems with plant growth.</i>	Identify the pests which cause problems with plants. <ol style="list-style-type: none">1. Weeds2. Diseases (pathogens)3. Insects (predators – insects and larger animals)
Objective 2 <i>A weed can be defined as any unwanted plant. Weeds may be unsightly in a lawn or field; however, they also compete with desirable plants in many ways.</i>	Explain how weeds affect plant growth. <ol style="list-style-type: none">1. Compete for light2. Compete for water3. Compete for nutrients
Objective 3 <i>Plant growth depends on many external factors and processes inside the plant. Diseases that infect plants can inhibit plant growth in many ways.</i>	Explain how diseases affect plant growth. <ol style="list-style-type: none">1. Interfere or inhibit photosynthesis2. Stunt plant growth3. Cause structural damage4. Reduce crop yields5. Reduce crop quality
Objective 4 <i>Much research has been conducted to reduce disease problems in plants. Many plant diseases can be prevented by using good management practices. Disease prevention or control measures should focus on eliminating one or more of the</i>	Identify the three conditions that must be present for a disease to develop. <ol style="list-style-type: none">1. Susceptible host – a weakened plant2. Virulent pathogen – a disease carrying organism capable of attacking a susceptible host3. Favorable environment – an environment that enhances contact between the susceptible host and virulent pathogen

Instructor Directions	Content Outline
<i>three conditions necessary for a disease to develop.</i>	
Objective 5 <i>Insects damage plants and disrupt the plant's growth and development. Through a better understanding of how insects damage plants, more efficient techniques of control can be used.</i>	Explain how insects inhibit plant growth. <ol style="list-style-type: none"> 1. Physical damage <ol style="list-style-type: none"> a. Eating plant tissue b. Sucking plant juices 2. Physiological damage <ol style="list-style-type: none"> a. Transmitting viruses to plant b. Depositing eggs into plant and disrupting natural processes
Application	Other activities <ol style="list-style-type: none"> 1. Have each student select an insect from an instructor-generated list and prepare a written report on its life cycle and its effect on plants. 2. Have each student select one plant disease from an instructor-generated list and prepare a written report on its effect on plant growth. 3. Depending on the time of year (warm weather), take a field trip around the school campus and locate insects that are on plants. Observe the eating habits of these insects.
Closure/Summary	Food is a vital commodity that all humans need. Plants and their ability to grow are greatly affected by pests. Weeds, diseases, and insects continue to damage food and fiber crops each year. By understanding how pests can damage plants, more efficient and successful techniques to control and prevent damage can be used.
Evaluation: Quiz	Answers: <ol style="list-style-type: none"> 1. False 2. True 3. True 4. True 5. True 6. d 7. b 8. a