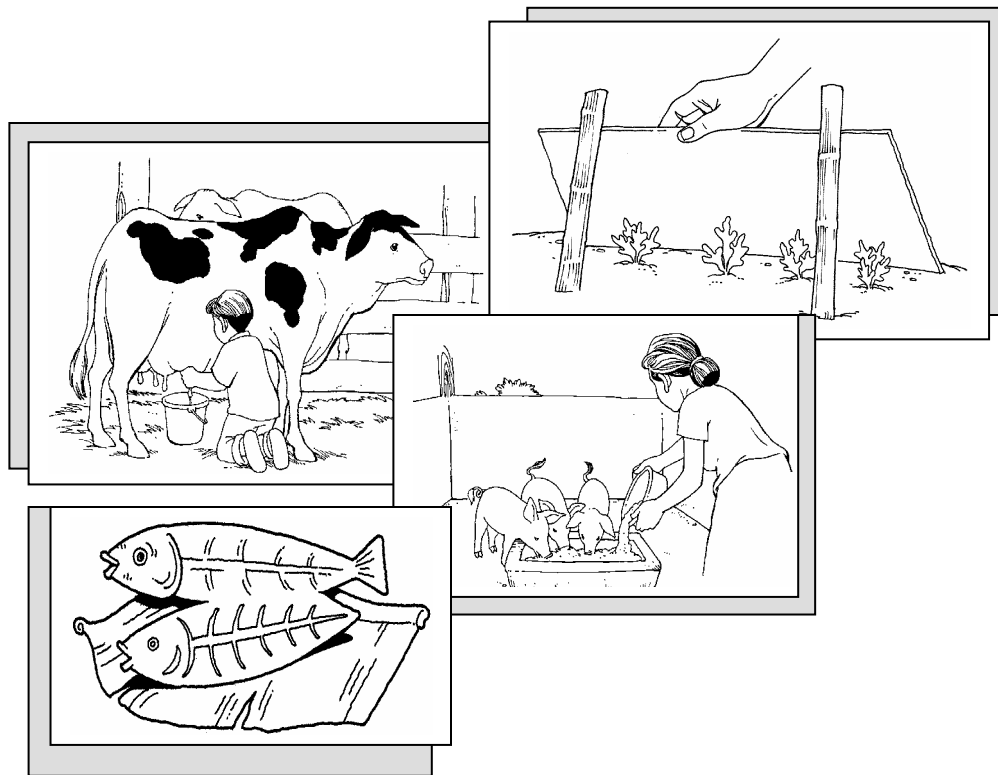


# PROJECT EASE

Effective and Affordable Secondary Education

TECHNOLOGY AND LIVELIHOOD EDUCATION

Agriculture and Fishery Arts



## MODULE 7

BUREAU OF SECONDARY EDUCATION

Department of Education  
DepEd Complex, Meralco Avenue  
Pasig City



# *Plant Crop Production*

## *First Year*

### *Module 7*

### *Watch Out for Little Creatures!*



#### *What this module is about*

Congratulations, dear student! This is your last module in plant production. Did you enjoy learning your modules in this unit? Were you able to learn a lot? I'm counting on you to do your best always!

This module focuses on the little creatures that infest plants. Loss in crop production is not only due to the problem of weeds but to the presence of insect pests, too. Growth of plants can be affected if attacked by insect pests. Wide infestation is a problem to most plant grower. This is why this module dwells on crop protection.

Insect pests are carriers of plant diseases. If they are not controlled, crop yield will diminish. Hence, observe insect pests in your garden and control them before it's too late.



#### *What to learn from this module*

In this module, you will know the different insect pests and the diseases common in plant production and how these are controlled. This module enables you to:

1. identify common plant pests and diseases;
2. explain how pests and diseases are classified;
3. discuss pest infestation;
4. identify and describe signs and symptoms of common plant diseases; and
5. explain how common plant pests and diseases are controlled.



## PRETEST

Directions: Encircle the letter of the correct answer.

1. It is an insect pest that metamorphoses from nymph to a winged adult.
  - a. aphid
  - b. caterpillar
  - c. scale insect
  - d. borer
  
2. Which of the following insect pests is a larva of moths or butterflies?
  - a. bugs
  - b. hoppers
  - c. cutworms
  - d. beetles
  
3. It is a disease sometimes called seed rot.
  - a. spot
  - b. mildew
  - c. mosaic
  - d. damping-off
  
4. This is a disease caused by molds or tiny plants that do not control chlorophyll.
  - a. bacteria
  - b. fungus
  - c. nematodes
  - d. virus
  
5. This disease usually attacks pepper and turns its leaves dark brown with lesions.
  - a. anthracnose
  - b. bacterial spot
  - c. mosaic
  - d. scab
  
6. It is a disease that curls the leaves of the plants and turns it in yellowish color.
  - a. mosaic
  - b. scab
  - c. spot
  - d. wilt
  
7. These are chewing insects, except one.
  - a. borer
  - b. cutworm
  - c. flies
  - d. potato weevil

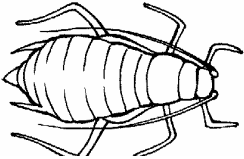
8. Which of the following insects is not a sucking pest?
  - a. aphid
  - b. hopper
  - c. squash bug
  - d. scale insect
  
9. Bacteria are single-celled organisms not capable of manufacturing their own
  - a. food
  - b. carbohydrates
  - c. chlorophyll
  - d. elements
  
10. The use of living organisms such as spiders and praying mantis in controlling insect pests is known as
  - a. mechanical method
  - b. biological method
  - c. chemical method
  - d. cultural method

# Lesson 1

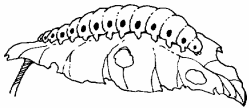
## Common Plant Pests and Diseases

Hello, dear student! In the previous module, you learned that weeds are breeding places of insect pests, which are carriers of plant diseases. Let us now find out how insect pests relate to diseases.

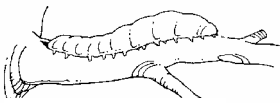
### Common Plant Pest



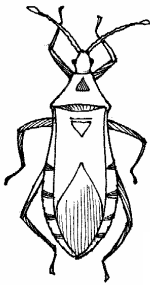
Aphids can change its body color to match the plant parts and turn from nymph to adult. It develops wings and fly to another plant host in the same plant family. Aphids mature in 12 days.



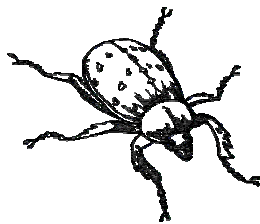
Cutworm is a larva of moths and butterflies. It hatches in the underside of leaves of plants. It is also called caterpillar.



Borers eat, grow, and hatch inside plant parts as caterpillar. When plant tops wilt suddenly, this shows that borers are around. Borer is a cousin of the cutworm.

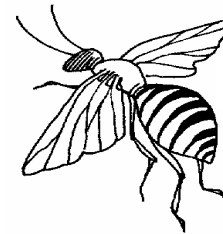


Bugs lay in white cottony masses. When young, bugs crawl like a scale insect. They excrete large amounts of honeydew that is why they are being followed by ants and mold fungus.



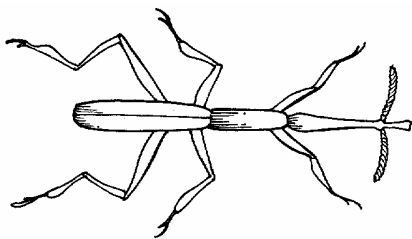
Beetle

Beetle eats all the leaves of its host plants.

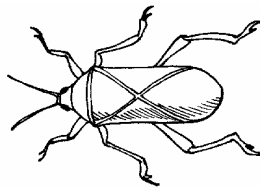


Fly

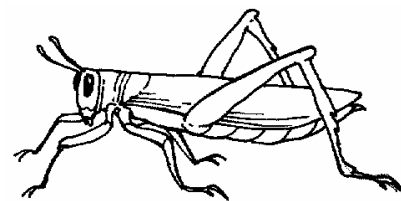
Fly lives on the underside of leaves. It is the cousin of the white fly.



Potato weevil

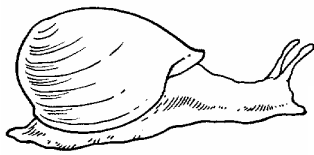


Squash bug

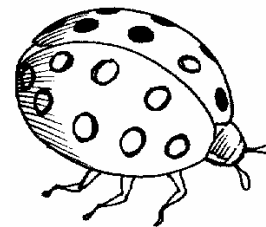
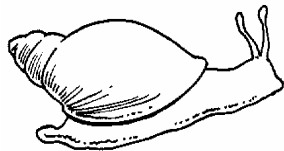


Hopper

- Hopper is also called Katydid. It is always in the garden particularly in the dry season. It defoliates plants and also strips the bark of young trees and shrubs.
- Scale insect can move from one host to another. When adult, scale insects do not move and stay with the host plant.
- Potato weevil is the most destructive insect pest that attacks sweet potato crops. It is ¼ inch (.635 cm) long. It has long-legged and slim body that looks like a large ant.
- Squash bug is brownish black in color and 1.69 cm long. The nymphs are white, black-legged creature. It has two small oval spots on the undersurface that emits a foul odor.

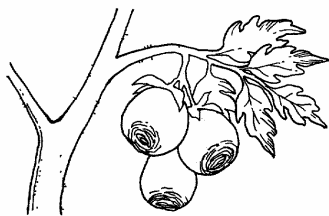


Slugs and snails



Mexican bean beetle

- Slugs live in slimy trails. In the daytime, you can find it under rocks and leaves. Slugs are busy looking for food at night.
- Mexican bean beetle has 16 black spots and has yellow and brown covers. Its larvae are spindly yellow grubs. It feeds on the leaves of bean plants.  
Now, here are the common plant diseases.



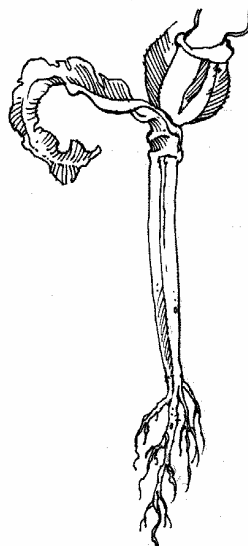
Antracnose



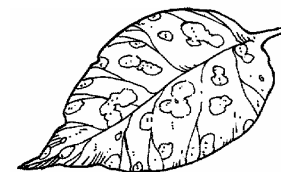
Tomato mosaic



Fungal disease



Damping-off



Bacterial spot

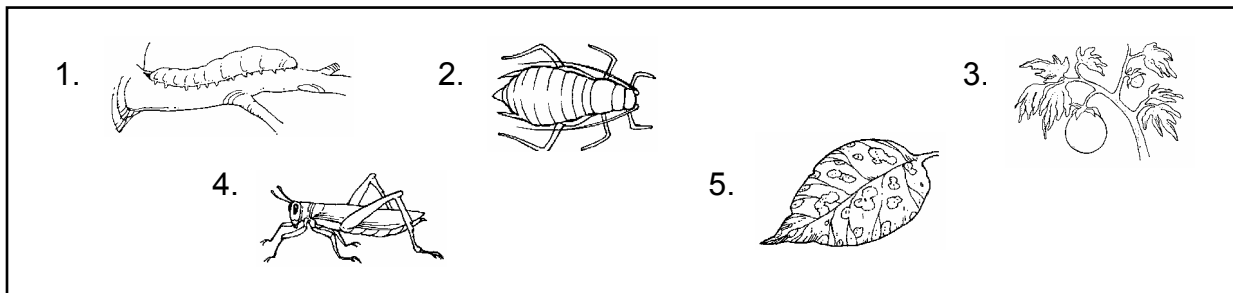


Scab

- Damping-off is sometimes called seed-rot which rots seeds easily when attacked.
- Anthracnose usually attack tomatoes. Fruits developed a water-soaked, sunken circular spots, usually with concentric rings. As a fruit rot, anthracnose attack ripe fruits.
- Bacterial spot usually attack pepper. Pepper leaves turn dark brown with lesions that turn yellow and fall. It is rough, blister-like spots that develop on the fruit.
- Scab develops distinct, round or elongated lesions with raised edges, giving a scabby appearance to petioles and stems.
- Tomato Mosaic causes the yellowing and curling of the leaves of tomato plants.
- Fungal disease usually looks like molds on the leaves of plants. Squash plant is often attacked by fungus.

### Activity 1

Label each illustration correctly.



Self-check:

Write on the blank the answer to each statement.

- \_\_\_\_\_ 1. An insect pest that changes body color to match plant parts.
- \_\_\_\_\_ 2. An insect that eats the leaves of plants of its plant host.
- \_\_\_\_\_ 3. It has 16 black spots and yellow to brown cover.
- \_\_\_\_\_ 4. A disease that rots seeds or seedlings.
- \_\_\_\_\_ 5. A disease of the pepper plant that turns its leaves dark brown with raised lesions.

## Lesson 2

### Classifying Insect Pests and Diseases

After identifying the plant pests and diseases, let us now classify them. Below is the classification of plant pests and diseases.

#### Grouping of Insects and Pests

Insect Groups	Insect Pests	Infestation
1. Chewing Insects	Cutworm, borer, beetles, hoppers, slugs, potato weevil, Mexican bean beetle	Have developed mouth parts. Eat up the foliage and other plant parts.
2. Sucking Insects	Aphids, bugs, flies, scale insects, squash bugs	Has a tube-like sucking mouth which is inserted into the leaves and stems of plants to suck their juice.





Remember, in plant crop production, diseases are as harmful as insect pests. Plants show signs of abnormalities due to the presence of destructive activities of microorganisms or pathogens.

Plant diseases are caused by various microscopic organisms as indicated in the following table:

Organisms	Descriptions	Plant Diseases
Virus	These are sub-microscopic organisms transmitted through the mouth parts of contaminated insects.	Tomato mosaic, cassava mosaic, potato yellow dwarf, rice stripe
Bacteria	These are single-celled organisms not capable of manufacturing their own food.	Black rot, soft rot, bacterial spot
Fungus	These are also known as molds. These are like plants but do not control chlorophyll and are not capable of manufacturing carbohydrates, their food.	Damping-off, seed rot, downy mildew, fungal diseases in squash

How well did you understand the lesson? Good! Now let us go on.

## Activity 2

Classify the following insect pests according to their way of infestations.

cutworm	bugs	flies
aphids	squash bug	potato weevil
hoppers	scale insects	slugs

Chewing Insects	Sucking Insects
1.	1.
2.	2.
3.	3.
4.	4.
	5.

## Activity 3

Classify the following diseases according to the organisms that cause them.

black rot	bacterial spot	damping-off
cassava mosaic	rice stripe	soft rot
potato yellow dwarf	seed rot	tomato mosaic

Viral Diseases	Bacterial Diseases	Fungal Diseases
1.	1.	1.
2.	2.	2.
3.	3.	
4.		



Self-check:

Write C if the statement is correct, and W, if the statement is wrong.

- \_\_\_\_\_ 1. Fungus and bacteria are organisms that cause plant diseases.
- \_\_\_\_\_ 2. Sucking insects have developed mouth parts.
- \_\_\_\_\_ 3. Chewing insects bite off and eat up foliage and other plant parts.
- \_\_\_\_\_ 4. Aphids, bugs, and flies are sucking insects.
- \_\_\_\_\_ 5. Bacteria are single-celled organisms not capable of manufacturing their own food.

## Lesson 3

### Control of Plant Pests

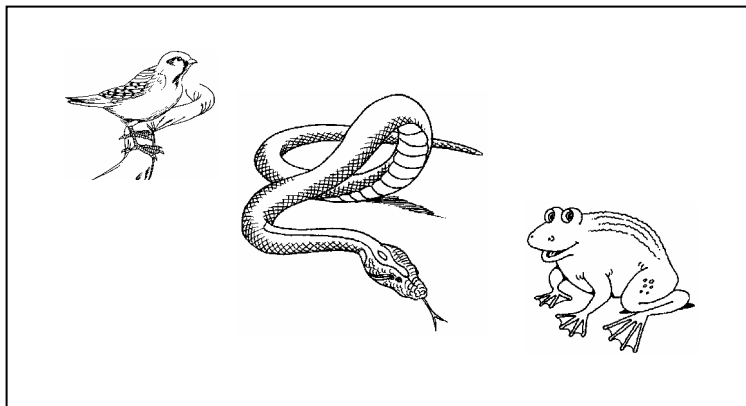
After knowing the different plant pests and diseases, you must likewise know the different ways of controlling them. This lesson helps you identify the ways of controlling plant pests and diseases.

#### Ways of Pest Control

##### 1. Cultural Method

- a. Good soil preparation - Healthy soil grows healthy plants that are more resistant to pests. Soil rich in humus contains a wide variety of beneficial microorganisms that trap nematodes and destroy or keep disease organisms dormant thereby encouraging beneficial insects.
- b. Use of indigenous varieties - Traditional varieties of plants are harder and relatively more resistant to pests.
- c. Pruning - Removal of diseased plant parts before these spreads to uninfected areas is preventive.
- d. Intercropping with aromatic herbs - Plants that are odorous are incorporated in the area to repel insects.
- e. Multiple cropping - Planting several varieties of plants on the farm can reduce host plants where pests attached themselves.
- f. Crop rotation - Adopt the practice of planting a pest resistant crop after a susceptible one.

2. Biological pest control - This refers to the use of pest populations by living organisms such as predators and parasites. Examples are the dragonfly, praying mantis, birds, spiders, toads, snakes, and among others.



3. Chemical pest control - This control method uses insecticides such as malathion, sevin and others.

## Type of Chemical Insecticides

- a. Stomach poison works against insects that eat the plant parts. Caterpillars, grasshoppers and beetles are destroyed by this type of insecticides.
  - b. Contact poison kills insects when hit or comes in contact with the poison. Any kind of insect can be controlled through contact poison, including insects that suck plants such as aphids and leafhoppers. Malathion is an example of this type of insecticides.
  - c. Systemic poisons are chemicals that enter the plant sap and move throughout the entire plant. They are effective in chewing and sucking insects which are poisoned when they suck juice from plants treated with chemicals.
  - d. Fumigants are actually contact poisons in gaseous form. The gases or fumes kill the insects that destroy plants.
4. Mechanical Method – It is the method of picking and crushing insects with the hand or catching them using nets and traps.
5. Botanical pest control -Plant parts are pounded, extracted and used to control insect pests. The santan flower is pounded and spread around stored grain to control corn weevil. Seeds of the neem tree are used to control rice pests and diamondback moth.

You can now select and apply any of the methods you have learned. Just always consider the environmental effects of the method you've chosen.

### Activity 4

Mang Eusebio is a plant grower. During two seasons of growing pechay, he experienced insect pests. This bothered him so he plans to stop growing plants.

1. What can you advise Mang to Eusebio?
2. Justify your advice.



Self-check:

Identify what the following statements are describing.

- \_\_\_\_\_ 1. The control of insect pests, using good soil preparation, the use of indigenous varieties and pruning.
- \_\_\_\_\_ 2. The control of pest population by living organisms.
- \_\_\_\_\_ 3. Use of malathion and sevin in controlling insect pests.
- \_\_\_\_\_ 4. The method of picking and crushing insects by hand or through the use of nets and traps.
- \_\_\_\_\_ 5. A method using plant extracts in the control of insects.

## Lesson 4

### Common Plant Diseases and Their Control

You learned how to control insect pests in the previous lesson. Now, let us find out how diseases are controlled in plant crop production. You need this information when you are managing your own farm or home backyard garden.

Damage caused by microorganisms which is visible in the physiological appearance of plant parts is known as symptom.



Damage is visible on the leaves, vascular tissues, roots and flowers of plants. When the disease organism is identified, a suitable fungicide is applied to the plant to control the disease.

Here are some ways of controlling plant diseases.

- Canker can be controlled by cutting the infected tissue of the tree. Keep the tree healthy and well fertilized.
- Gall or abnormal swelling in plants can be destroyed by cutting the infected tissue of the plant or by spraying with fungicide.
- Leaf blight is a plant disease characterized by general browning, death of foliage and falling of leaves. This can be controlled by destroying all the falling leaves and spraying with fungicides every two weeks.
- For mildew, you can destroy all infected parts or you can use sulfur fungicide.
- Rot can be controlled through crop rotation. Fruit rot can be checked through sanitation and spraying fungicides.
- Rust can be destroyed by removing its intermediate host. Select a rust resistant variety and spray with fungicide.
- Wilt is a plant disease characterized by loss of turgidity especially in leaf tissues. This can be prevented by spraying with fungicides. Use resistant varieties and practice crop rotation.
- Viral diseases can be prevented through rigorous sanitation program. If infestation is severe, destroy the plant completely.

Note that most of the plant diseases presented are eliminated through the cultural and chemical methods.

Botanical method can also be employed in controlling plant diseases. Plant part extracts are used such as cloves of garlic, leaves of Acapulco, onion bulbs and others.

Another practice in the control of plant diseases is sanitation. This is done by destroying weeds, cleaning the garden, and the surroundings as well as the tools used.

## Activity 5

Analyze the given situation then answer the questions that follow.

Mang Pedring is a plant grower who specializes in tomato production. One day, he noticed that the leaves of some tomato plants were drying up even if watering was thoroughly done. Help Mang Pedring solve his problem before its too late.

Questions:

1. What plant disease has infected Mang Pedring's tomato plants?
2. Suggest three ways of controlling it.
  - a.
  - b.
  - c.



Self-check:

Identify what each of the following statements is about.

- \_\_\_\_\_ 1. It is a disease that distorts, deform and curl the plants if infestation takes place.
- \_\_\_\_\_ 2. It is a popular chemical that destroys fungal diseases in plants.
- \_\_\_\_\_ 3. It is a method of controlling disease using plant extracts.
- \_\_\_\_\_ 4. It is a practice of controlling disease by cleaning the garden area.
- \_\_\_\_\_ 5. Damage caused by microorganisms is visible in the appearance of plant parts.



LET'S SUMMARIZE

- ❖ Common insects pests in plants are as aphids, cutworms, borers, bugs, beetles, flies, hoppers, scale insects, slugs, sweet potato weevils, among others.
- ❖ Damping-off, anthracnose, bacterial spot, scab, tomato mosaic, and fungus are some of the common diseases in plants.
- ❖ Insect pests in plants are classified into two groups. These are the chewing insects and the sucking insects.
- ❖ Plant diseases are classified as to virus, bacteria and fungus.
- ❖ Control of plant pests can be done through cultural method, biological method, chemical method, botanical pest control and mechanical method.
- ❖ Common Plant Diseases and their Control
  - a. Canker            -cultural
  - b. Gall               -fungicide
  - c. Leaf blight       -fungicide

- d. Mildew        -fungicide
- e. Rot            -cultural; fungicide
- f. Rust           -fungicide
- g. Wilt           -crop rotation; fungicide
- h. Viral           -sanitation



## POSTTEST

Directions: Encircle the letter of the correct answer.

1. It is an insect pest that metamorphoses from nymph to winged adult.
  - a. aphid
  - b. caterpillar
  - c. scale insect
  - d. borer
  
2. Which of the following insect pests is a larva of moths and butterflies?
  - a. bugs
  - b. hoppers
  - c. cutworms
  - d. beetle
  
3. It is a disease sometimes known as seed rot.
  - a. spot
  - b. mildew
  - c. mosaic
  - d. damping-off
  
4. Which is a disease caused by molds that does not control chlorophyll?
  - a. bacteria
  - b. fungus
  - c. nematodes
  - d. virus
  
5. This disease is usually found in pepper, the leaves of which turn dark brown with raised lesions.
  - a. anthracnose
  - b. bacterial spot
  - c. mosaic
  - d. scab
  
6. It is a disease of tomato plants whose leaves turn yellowish and curl.
  - a. mosaic
  - b. scab
  - c. spot
  - d. wilt

7. These are chewing insects, except one.
- a. borer
  - b. cutworm
  - c. flies
  - d. potato weevil
8. Which of the following insects is not a sucking pest?
- a. aphid
  - b. hopper
  - c. squash bug
  - d. scale insect
9. Bacteria are single-celled organisms not capable of manufacturing their own
- a. food
  - b. carbohydrates
  - c. chlorophyll
  - d. elements
10. The use of living organisms such as spiders and praying mantis in controlling insect pests is known as
- a. mechanical method
  - b. biological method
  - c. chemical method
  - d. cultural method





## ANSWER KEY

### Pretest / Posttest

1. a
2. c
3. d
4. b
5. b
6. a
7. c
8. b
9. a
10. b

### Lesson 1: Activity 1

1. borer
2. aphid
3. tomato mosaic
4. hopper
5. bacterial spot

### Lesson 1: Self-check

1. aphid
2. beetle
3. Mexican bean beetle
4. damping-off
5. bacterial spot

### Lesson 2: Activity 2

Chewing Insects  
cutworm  
hoppers  
potato weevil  
slugs

Sucking Insects  
aphids  
bugs  
squash bug  
scale insects

flies

Lesson 2: Activity 3

Viral	Bacterial	Fungal
1. Cassava mosaic 2. Potato yellow dwarf 3. Rice stripe 4. Tomato mosaic	1. Black rot 2. Bacterial spot 3. Soft rot	1. Seed rot 2. Damping-off

Lesson 2: Self-check

1. C
2. W
3. C
4. C
5. C

Lesson 3: Activity 4

1. He can apply crop rotation.
2. This will eliminate diseases present in plants due to other crops planted.

Lesson 3: Self-check

1. Cultural method
2. Biological method
3. Chemical pest control
4. Mechanical method
5. Botanical pest control

Lesson 4: Activity 5

1. Wilt
2. a. Fungicide  
b. Planting resistant varieties  
c. Crop rotation

Lesson 4: Self-check

1. Viral disease
2. Fungicide
3. Botanical
4. Sanitation
5. Symptom