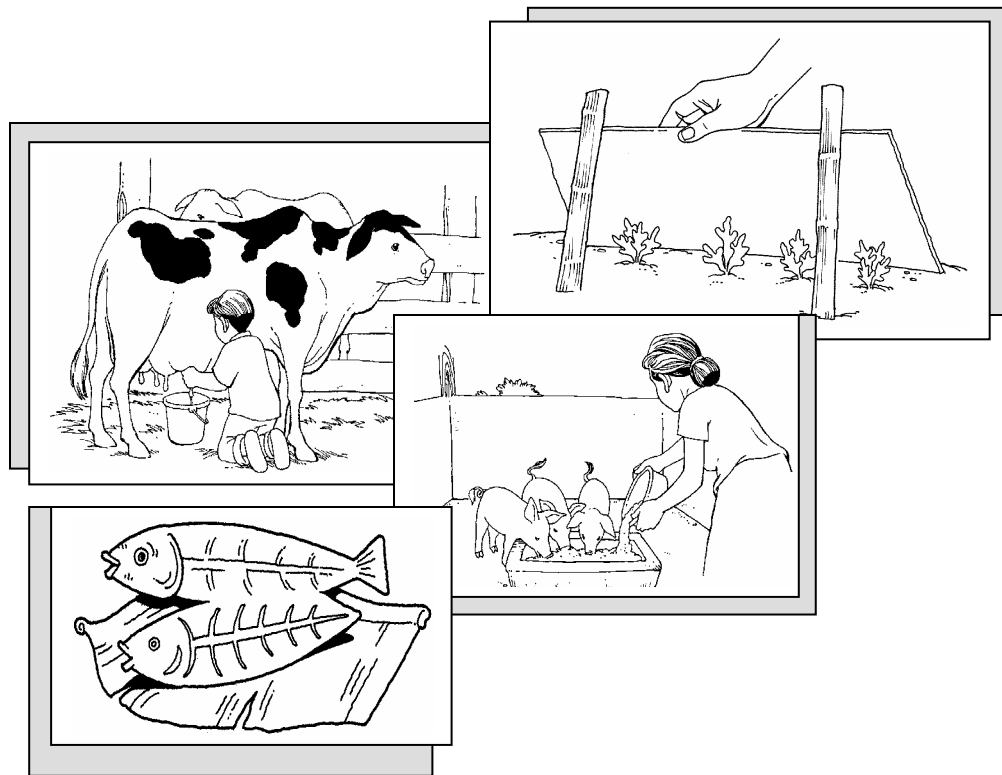


PROJECT EASE

Effective and Affordable Secondary Education

TECHNOLOGY AND LIVELIHOOD EDUCATION

Agriculture and Fishery Arts



MODULE 4

BUREAU OF SECONDARY EDUCATION

Department of Education
DepEd Complex, Meralco Avenue
Pasig City



Plant Crop Production

First Year

Module 4

Pure Water Pure Delight



What this module is about

Are you enjoying your lessons? Do you enjoy working on the different activities in each module? You are truly fortunate to have these challenging learning experiences.

After learning how to grow plants, this time you will be exposed to experiences relating to healthy plants glowing with life in the morning sunlight. Plants grow healthy when properly watered. Yes, one of the most vital elements in crop production, is water.

Most plants can adapt to environmental conditions which are not that ideal but without water, they wither and die.



What to learn from this module

This module dwells on water without which both man and plants will die. After studying this module, see how well you can do these:

1. explain the role of water to plant growth; and
2. discuss the different ways of watering plants.



PRETEST

Write only the letter of the correct answer on your paper.

1. Which of the following activities of plants relates to the availability of water?
 - a. growth of flowers
 - b. seed development
 - c. growth of plant leaves
 - d. all of the above
2. Following are instances when plants need water, except one.
 - a. after sowing the seed
 - b. after planting the seed
 - c. when they bear flowers

- d. after transplanting
3. Shallow rooted vegetables such as pechay and cabbage need much water because
 - a. their bodies are composed of water
 - b. they are deeply rooted compared to other vegetables
 - c. their leaf respiration is very high
 - d. they bear fruits more than other plants
 4. The supply of water done through small channels or furrows.
 - a. surface irrigation
 - b. watering in hose
 - c. sprinkler irrigation
 - d. drip irrigation
 5. Drip or trickle irrigation refers to the supply of water through small openings
 - a. emitters
 - b. nozzle
 - c. water cans
 - d. hose

Lesson 1

The Role of Water in Plant Growth

You may recall from the module, “Grow a Glorious Plant”, that in order to survive the heat of the sun, seedlings need water four times a day particularly when newly transplanted. Do you know why? It is due to much water loss which might wilt the seedlings. The roots of plants must be capable of absorbing enough water to keep the plants alive.

Imagine yourself as a plant. What do your flowers, fruits and leaves need in order to survive? What do you need to keep healthy? Can your roots absorb nutrients from the soil without water?

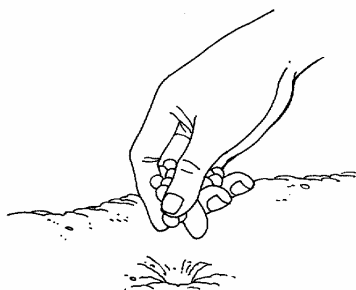
One of the most important factors in successful gardening is water. If watering systems are poor, plant growth is stunted and plants may wilt or die. Hence, plants must be watered regularly and thoroughly.



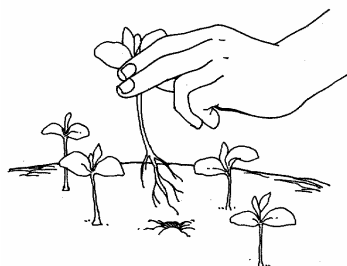
Now you might ask, when is the right time to water plants? Study the pictures on the next page to know when to water plants.

Watering is needed...

a. after sowing the seeds.



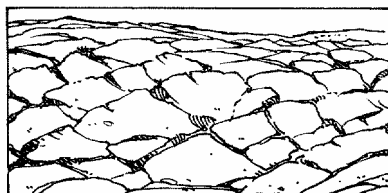
b. after planting the seeds.



c. after transferring seedlings from one seedbox to another by pricking.

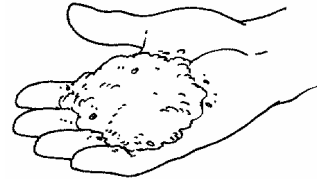
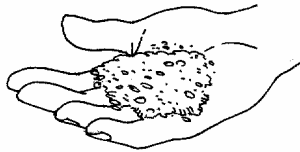


d. after transplanting.



e. everytime the soil dries up.

How will you know that the soil is dry? Look at the following illustrations.



Can you analyze what the three pictures are trying to say?

1. Which of the illustrations show that soil needs watering?
2. Why?

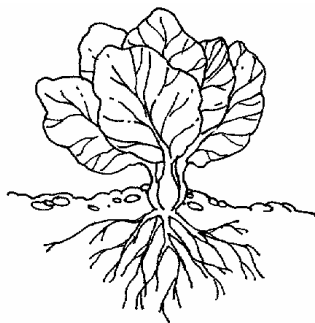
Infrequently watered plants like tomatoes and eggplant need thorough watering, because they are deeply rooted. Shallow rooted plants are frequently watered. Pechay, mustard, and celery must be watered twice a day, because their roots are near the surface of the earth. Hence, water evaporates fast. Their bodies are also succulent.

Time should also be considered when watering plants. It is best to water plants in the morning. Never water plants late in the afternoon when the sun is no longer shining. The moist environment at night invites plant diseases.

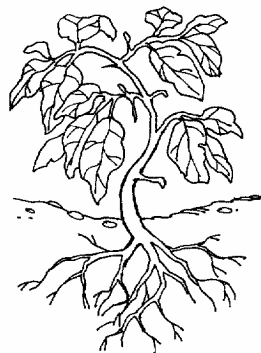
Now, let us check if you really understood what you read. Work on the activities below.

Activity 1

Observe the pictures below then answer the questions that follow.



A



B

1. Which of the plants needs more water?

2. Why?

Activity 2

Below are vegetable plants growing in your garden. Identify which vegetables need frequent watering and which ones do not. Write your answers in the box below.

- | | | |
|----------|---------|-----------|
| pechay | mustard | tomatoes |
| eggplant | okra | kangkong |
| pepper | onion | malunggay |
| cabbage | celery | katuray |

Frequently Watered	Infrequently Watered
1.	1.
2.	2.
3.	3.
4.	4.
5.	5.
6.	6.



Self-Check:

Write the missing words on the blank to complete the sentence.

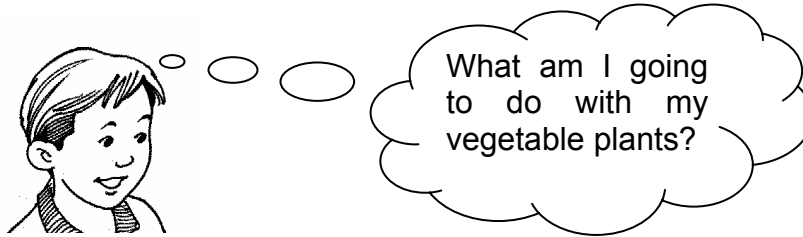
1. One of the most important factors in growing plants is _____.
2. Watering of vegetables depends on the _____ of the plant.
3. The best time to water plants in the _____.
4. It is not advisable to water plants _____ in the afternoon.
5. Eggplant is an example of vegetable that is _____ watered.

Did you get all the answers right? If you did, excellent! If not, you can go over the lesson again.

zLesson 2

Different Ways of Watering Plants

Now that you already know the role of water in plant growth, let us move on to how plants can be supplied with water. In this lesson, you will learn the different ways of watering plants from backyard and school to large-scale plant crop production.



Imagine that you have a vegetable garden and it relies mainly on rain. However, for a long period of time, still, there's no rain. What do you think will happen to your vegetable crops? Surely, your crops will wilt and eventually die if still not watered. Hence, you will find ways of bringing water to your plants.

How can this be done? It can be done through water irrigation. Irrigation refers to the supply of water to a farm when rainfall is not sufficient enough.

Water is conducted for long distances through open ditches or irrigation canals until it reaches the land to be irrigated. Water supply may come from rivers, mountain streams, natural and artificial lakes and reservoirs of stored water.

Water irrigation is used on vegetable through the following ways or methods:

1. Surface or furrow irrigation



*Photo by David Frazier
Encarta 2000*

This is done by running water through small channels or furrows. Water moves down or across the slope of the field. It sips into the bottom and sides of the furrows to provide the desired wetting. This is applicable only for row crops in fields with uniform slopes.

2. Sprinkler irrigation



*Photo by Bill Grange
Encarta 2000*

Artificial rain is generated through special devices such as perforated sprinkler lines, rotating sprinklers, or micro sprinklers. The water source is usually a river, a shallow well or tap water. This method is labor intensive and the water source must be near the farm.

However, in non-mechanized farming, this is done by using watering cans. The cans are attached to a perforated nozzle capable of delivering water fast enough without causing damage to the plants.

Nozzles are easily attached from the can to remove debris, particularly when water sources are rivers and canals.

In some mechanized farms, a rotating sprinkler is used. It is popular in orchards and large nurseries. It consists of a head with one or more nozzle which is rotated by the action of the water passing through, and which waters the circular portion of the field around the sprinkler. This method is capable of furnishing water at relatively slow rate, while using relatively large nozzles.

3. Drip-irrigation

This is also known as trickle irrigation. The technique refers to the thorough application of water to the soil through small openings or emitters, which are designed to discharge water at the rate of 1-8 liters per hour. The emitters are close to the plant, wetting only these areas and leaving the rest of the field dry. Unlike sprinkle irrigation and flooding which wet the entire field.

4. Sub-irrigation

This is the least common method of irrigation because of its high initial cost and the limited land suitable for its use. This is usually done on peat soil. Water is supplied by an underground system and reaches the plant by capillary movement. The drip irrigation system can be installed underground to serve as sub-irrigation system.

After the discussion on the different methods of watering plants, were you able to identify those applied in your own school or home garden?

Now let us find out how much you have learned from this lesson. Answer the self-check exercise below.



Self-check:

Identify the following:

- _____ 1. It refers to the supply of water to a farm where there is no sufficient rainfall.
- _____ 2. Water is allowed to flow along plant beds.
- _____ 3. Water is supplied to plants using watering cans.
- _____ 4. Also known as trickle irrigation.
- _____ 5. It is a material attached at the end of a watering can to remove debris.

Congratulations! You have already finished this challenging module. Isn't it exciting? I hope this helped you gain a lot of knowledge.



LET'S SUMMARIZE

- ❖ Plants need watering after sowing the seeds; after planting the seeds; after transferring the seedlings from the seedbox to another by pricking; and after transplanting.
- ❖ It is advisable to water plants in the morning.
- ❖ Irrigation is the supply of water to a farm when rainfall is not sufficient.
- ❖ Surface irrigation is done by running water through small channels or furrows.
- ❖ Drip-irrigation is the thorough application of water to the soil through small openings or emitters.



POSTTEST

Choose the correct answer by encircling its letter.

1. Growth development in plants is closely related to
 - a. air
 - b. water
 - c. compost
 - d. farmer

2. In which plant stage is water much needed?
 - a. fruit development
 - b. flowering
 - c. harvesting
 - d. transplanting

3. Which of the following groups of vegetables need more water daily?
 - a. pechay and cabbage
 - b. tomato and eggplant
 - c. pepper and ube
 - d. okra and beans

4. Surface irrigation is done through
 - a. small channels or furrows
 - b. the use of water cans
 - c. a hose
 - d. sprinkler

5. Use of watering cans with nozzles to water plants.
 - a. drip irrigation
 - b. surface irrigation
 - c. sprinkler irrigation
 - d. furrow irrigation



ANSWER KEY

Pretest

1. d
2. c
3. a
4. a
5. a

Activity 2

Frequently Watered

1. pechay
2. cabbage
3. mustard
4. celery
5. kangkong
6. onion

Infrequently Watered

1. eggplant
2. pepper
3. okra
4. tomatoes
5. malungay
6. katuray

Lesson 1: Self-check

1. water
2. root
3. morning
4. late
5. infrequently

Lesson 2: Self-check

1. irrigation
2. furrow or surface irrigation
3. sprinkler irrigation
4. drip irrigation
5. nozzle

Posttest

1. b
2. d
3. a
4. b
5. c