

PENANG SANGAM HIGH SCHOOL
P.O.BOX 44, RAKIRAKI
LESSON NOTES

School: Penang Sangam High School
Subject: Agricultural Science
Year/Level: 11

Week 16

Strand	Strand as 11.3 Agronomy
Sub Strand	Sub-strand 11.3.2 HORTICULTURE
Content Learning Outcome	Demonstrate the assessment methods used in determining the physical properties of the soil.

LESSON 2: Evaluating and Describing Soil Consistency

LESSON OUTCOME: *At the end of this lesson the student will discuss how soil consistency is evaluated and described.*

Vocabulary

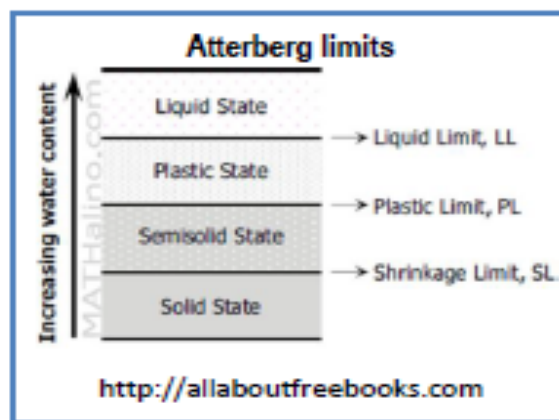
- Atterberg Limits - a basic measure of the critical water contents of a fine-grained soil, such as its shrinkage **limit**, plastic **limit**, and liquid **limit**.

Notes

Soil consistency is evaluated using the “Atterberg Limits”. Albert Mauritz

Atterberg, a Swedish scientist, considered the consistency of soils in 1911 and proposed a series of tests for defining the properties of cohesive soils. He found that:

- At very low moisture content, soil behaves more like a solid.
- When the moisture content is very high, the soil and water may flow like a liquid.



Hence, on an arbitrary basis, depending on the moisture content, the behaviour of soil can be divided into 4 basic states:

1. solid,
2. semisolid,
3. plastic,
4. liquid.

Based on the above, soil consistency is evaluated and described for three moisture levels:

- 1. Wet soils:** Consistency is denoted by terms stickiness and plasticity.

Stickiness is grouped into four categories namely

- i) non sticky, slightly sticky, sticky, very sticky

There are four degrees in plasticity namely

- i) non plastic, slightly plastic, plastic, very plastic

Student Activity

Differentiate among the solid, semisolid, plastic and liquid states of soil consistency?

AS11.3.1 HORTICULTURE

AS11.3.2.1 ASEXUAL PROPAGATION IN PLANTS

Lesson 1: Overview of Crop Production,

Vocabulary

Natural vegetative propagation – which occurs naturally in plants.

Artificial vegetative propagation – which is assisted by human intervention.

Sexual reproduction – production of offspring involving two parents releasing gametes or sex cells e.g. using seeds.

Asexual reproduction - production of offspring involving single parent from which the planting material is extracted e.g. stem cuttings.

Gametes - refers to sex cells released from parents.

Male gametes (plant) - refers to pollen grains.

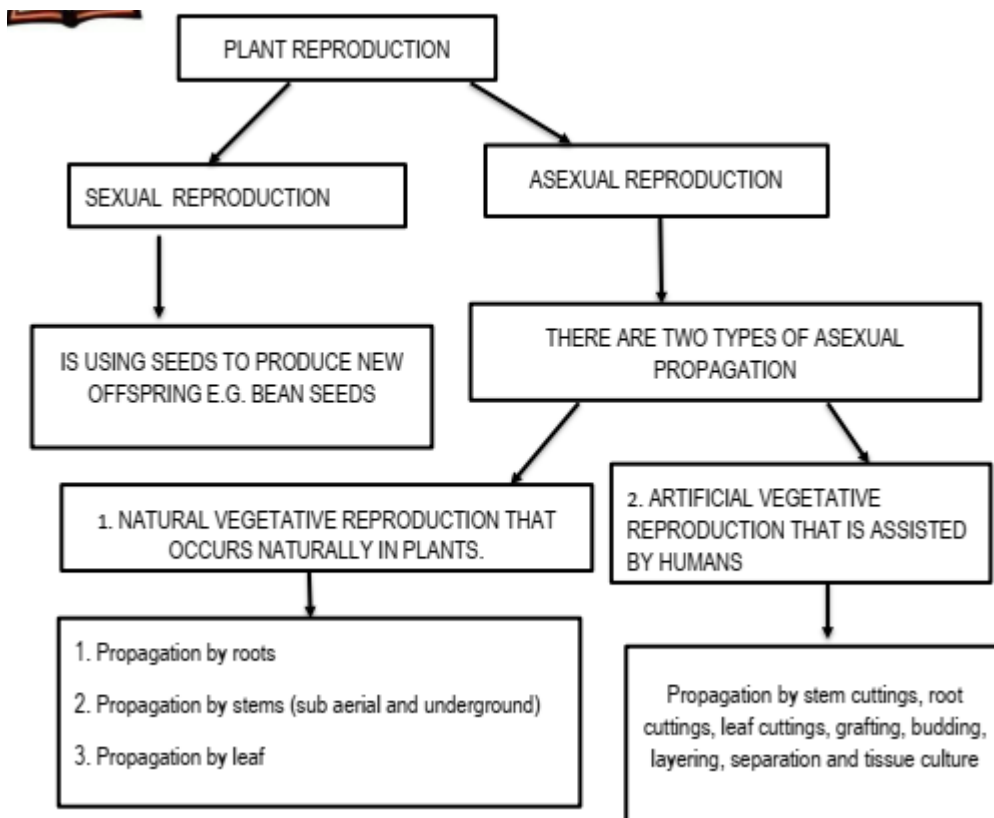
Female gametes (plant) - refers to ovules produced in the ovary.

Pollination – transfer of pollen grains from anther to stigma of flower by agents of pollination.

Fertilisation - fusion of male and female gametes to form a zygote.

Embryo - is an advanced developmental stage of cells after zygote formation.

Seed Dormancy - resting stage of seeds or inactive growth stage of seeds.



Homework

1. Describe the following terms?

a. Crop Reproduction

b. Plant propagation

2. Differentiate between Sexual reproduction and Asexual reproduction

3. Differentiate between Artificial vegetative propagation and Natural vegetative propagation

Lesson 2: SEXUAL REPRODUCTION

Vocabulary

Stamen – male part of the flower. **Pistil** – Female part of the flower

Axillary Bud – (or lateral bud) is an embryonic shoot located in the axil of a leaf.

Node – The part of a plant stem from which one or more leaves emerge, often forming a slight swelling

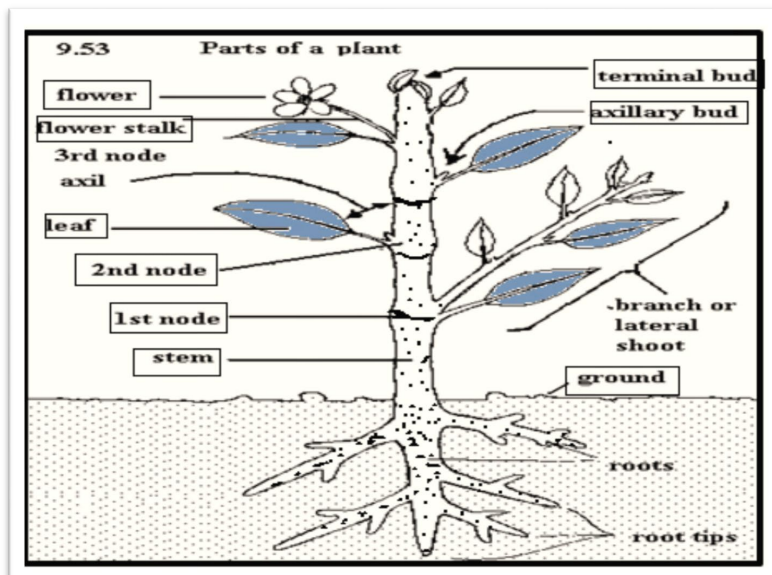
Prop Roots – An aerial root that arises from a stem or trunk, penetrates the soil, and helps support the plant, as in mangroves. Also called stilt root .

Underground stems – are modified plant structures that derive from stem tissue but exist under the soil surface e.g. bulbs, corms, rhizomes.

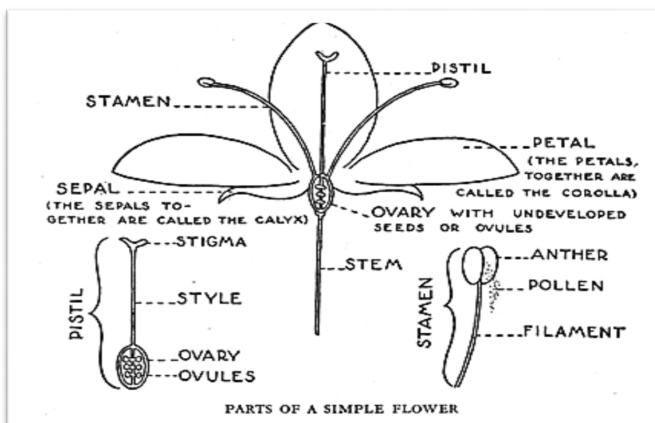
Leaf Venation – The distribution or arrangement of a system of veins, as in an a leaf blade

Aestivation – the arrangement of petals and sepals in a flower bud before it opens.

Parts of a plant



Parts of a simple flower



The Roots

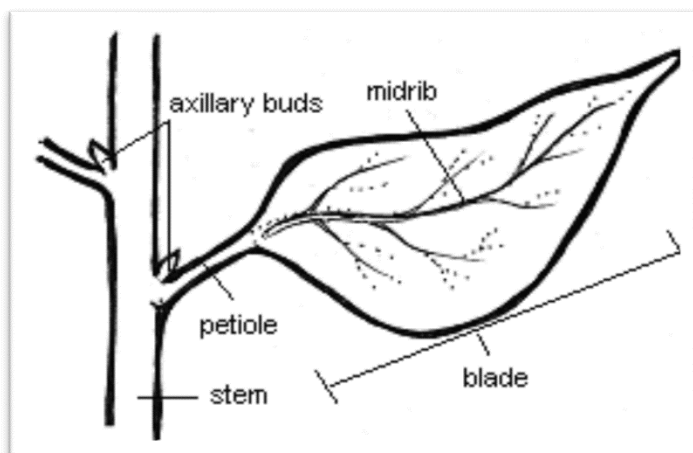
- The main functions of the root system are absorption of water and minerals from the soil, providing a proper anchorage to the plant parts, storing reserve food material and synthesis of plant growth regulators.
- Hanging structures that support a mangrove tree are called prop roots. Similarly, the stems of maize and sugarcane have supporting roots coming out of the lower nodes of the stem. These are called stilt roots.

The stem

- The regions of the stem where leaves are born are called nodes while internodes are the portions between two nodes.
- Some stems perform the function of storage of food, support, protection and of vegetative propagation
- Underground stems of potato, ginger, turmeric, and, colocasia are modified to store food in them.
- Stem tendrils which develop from axillary buds, are slender and spirally coiled and help plants to climb such as in gourds (cucumber, pumpkins, watermelon) and grapevines. A terminal bud is the primary growing point at the top of the stem of a plant. An example of terminal bud is where a flower opens up on a plant.
- Axillary buds of stems may also get modified into woody, straight and pointed thorns. Thorns are found in many plants such as Citrus, Bougainvillea. They protect plants from browsing animals.
- Underground stems of some plants such as grass and strawberry, etc., spread to new niches and when older parts die new plants are formed.

The leaf

- Leaves originate from shoot apical meristems. Leaf develops at the node and bears a bud in its axil. The axillary bud later develops into a branch.
- A typical leaf consists of three main parts: leaf base, petiole and lamina. The petiole help hold the blade to light. Long thin flexible petioles allow leaf blades to flutter in wind, thereby cooling the leaf and bringing fresh air to leaf surface.
- The lamina or the leaf blade is the green expanded part of the leaf with veins and veinlets. There is, usually, a middle prominent vein, which is known as the midrib.
- Veins provide rigidity to the leaf blade and act as channels of transport for water, minerals and food materials.



The Flower

1. The flower is the reproductive unit in the plants. It is meant for sexual reproduction. Androecium and gynoecium are reproductive organs.
2. When a flower has both androecium and gynoecium, it is called bisexual. A flower having either only stamens or only carpels is unisexual.
3. Aestivation: The mode of arrangement of sepals or petals in floral bud with respect to the other members of the same whorl is known as Aestivation.

Homework

1. Differentiate between Axillary Bud and Terminal Bud on a plant?

2. Differentiate between bisexual flowers and unisexual flowers of plant?
