

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

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

Week 15

Strand	Strand as 11.3 Agronomy
Sub Strand	Sub-strand 11.3.1 Soils
Content Learning Outcome	Demonstrate the assessment methods used in determining the physical properties of the soil.

LESSON 3: MAINTAINING and IMPROVING SOIL STRUCTURE

LESSON OUTCOME: *At the end of this lesson the student will discuss ways in which soil structure can be improved.*

Soil structure can be maintained by employing conservation management practices:

1. **Tillage-** Only till soil when it is at the proper moisture content. Tilling when the soil is too wet will cause the soil to become cloddy and will destroy aggregates. Farmers may decide to use conservation tillage methods including zero tillage, minimum tillage, strip tillage, ridged tillage, and mulch tillage. They may choose to stop tilling using machines and revert to using animal.
2. **Cultivate only when the soil is not too wet** -Farmers are to get their soils tested and seek advice from the Ministry of Agriculture on the best moisture content for the tillage of soil.
3. **Adding organic matter-** Grow a green manure crop and plough in crop residues instead of removing or burning. Plant cover crops in fall and winter, turn under crop residue and add manure.

Student Activity

1. Discuss the difference between maintaining and improving soil structure.

2. Discuss ways in which farmers can maintain and improve soil structure.

SOIL CONSISTENCE

LESSON 1: WHAT IS SOIL CONSISTENCE?

LESSON OUTCOME: *At the end of this lesson the student will define soil consistence and discuss factors which influence soil consistence.*



Cohesion	- attraction of one molecule to another molecule of the same type
Adhesion	- attraction of one molecule to another molecule of a different type.
Stickiness	- having the property of adhering or sticking to another surface.
Plasticity	- capacity to be moulded (to change its shape depending on stress) and to retain the shape even when the stress is removed

- ✓ Soil consistence is the ability of soil particles to stick together [cohesion] or to stick to other objects [adhesion] and so resist deformation and rupture when under stress.
- ✓ It is the measure of the mechanical strength of a soil, based on the force necessary to break a block of soil or penetrate a clod.
- ✓ Consistence indicates
 - a. Amount and type of clay material
 - b. Condition for tillage
 - c. Potential for compaction

Soil consistence is influenced by

1. Soil texture - soil strength increases with increasing clay content.
2. Mechanical Soil compaction compaction – the particles of soil which are compact tend to have higher consistency
3. Organic matter content – organic matter acts as a cementing agent, binding soil particles together.
4. Cementing agents – organic matter, silicate clays, lime (CaCO_3) and sesquioxides (Al_2O_3 , La_2O_3) hold soil particles together.
5. Soil density - as density increases so does soil strength. You have more material in the same area which makes it harder for the plant root to grow
