**YEAR 10 - WORKSHEETS - WEEK 1**

**SUBSTRAND 10.3.1 SOIL SCIENCE**

**Lesson 26** Cultivation Practices Used In Fiji

**Outcome** : Identify cultivation practices used in Fiji

**Describe the cultivation practices in relation to soil sustainability**

-The main purpose/principle/ or aim of cultivation is to turn soil into fine tilth to provide ideal/best environment for seeds to germinate.

-Cultivation is also a traditional way of weed control.

-It can be done manually(hand tools) or with the help of animals and machines.

Steps in cultivating soil :

* Turning soil – hand tools(digging fork)

-ploughing(disc/mouldboard)

* Preparing soil to fine tilth- harrowing

-rotovating

* Form seedbed- vegetable plots

-ridges

* Remove debris –harrowing

-raking

* Leveling – raking

-rotovating

* Planting

Example : to grow vegetables – the sequence of preparing soil in a small area would be

* Digging
* Breaking soil
* Form seedbed(raise plots)
* Remove debris(raking)
* Level seedbed/plots
* Planting

**Activity**

Explain the reason why it is important to cultivate soil in the right sequence.

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Describe the cultivation practices required to be carried out in achieving quality production of cucumber.

**Lesson 27** : Soil Erosion

**Outcome** : Identify the types of soil erosion

**Erosion**- removal of topsoil from an area due to action of rain and wind

**Run-off** – rainwater that does not go into the soil but flows over the soil surface

Types of erosion

1. **Rill erosion**- happens when raindrops fall on soil surface and remove soil particles along narrow tracks(rills)
2. **Sheet erosion** – uniform removal of soil particles from the surface in thin layers.
3. **Gully erosion** – happens when rain does not sink into the soil and part runs off over the surface removing soil particles along the way. This can become deeper forming trenches.
4. **Splash erosion** – caused by raindrops which removes soil particles.

Agents of erosion

* Wind
* Water
* Gravity
* Glaciers

**Activity**

Explain how runoff causes erosion.

Describe what gully erosion is.

**Lesson 28**: Soil Conservation

**Outcome** : Identify methods of soil conservation

**Soil conservation** : protecting soil from erosion

**Soil productivity** : how much soil can produce

Importance of soil conservation

* Maintain organic matter and biological life
* Ensure secure food supply
* Save farmers money

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| **Factors that accelerate soil erosion** | Increase speed of water/wind | Poor soil structure | Loss of ground cover |
| **How erosion can be reduced** | Decrease amount and speed of water/wind | Avoid damaging soil structure | Provide ground cover |
| **Soil conservation practices** | Contour  Terracing | Minimum tillage  Mulching | Cover cropping  Mulching |

Activity

State two reasons why farmers should practice soil conservation.

List two ways on how farmers can reduce the amount and speed of water and wind.

Name two ways in which farmers can maintain the structure of soil.

**Lesson 29** Contour Farming

**Outcome** : Explain how contour farming control erosion

Contour – across the slope

* contour farming is cultivating, planting **across** the slope

**How contour farming control erosion**

* keeps valuable topsoil in place
* slow water flow down the slope
* improve irrigation and conserve water

**Lesson 30** : Terrace Farming

**Outcome** : Explain how terracing controls erosion

Terrace : cutting slopes into steps

* terracing is the cutting of steep slopes into step like structure

**How terracing controls erosion**

* slows down the speed of water on steep slopes( water stops on level plains instead of flowing down directly)
* planting can be done on the level areas which will hold the soil particles

**Lesson 31**: Minimum Tillage

**Outcome** : Explain the importance of minimum tillage in soil conservation

What is minimum tillage

* it is a way of growing crops with minimum disturbance to the soil. Also known as zero tillage.
* Slashing or chemicals are used to control weeds

**How minimum tillage minimizes erosion**

* Protect soil from degradation(through stubble retention)
* High level of organic matter/biological activity
* Increase water infiltration
* Increase recycling of minerals in soil

**Lesson 32** : Mulching

**Outcome :** State the importance of mulching in soil conservation

**Mulch** : spreading of loose materials(organic/inorganic) on soil surface

What is mulching

It is simply spreading a layer of material (organic /inorganic) on surface of soil

Materials used for mulching

* Grass clippings
* Wood shavings
* Leaves
* Gravel/plastic

**How mulching helps in soil conservation**

* Protect soil from erosion
* Reduce impact of raindrop on soil surface
* Conserve soil moisture
* Maintain soil temperature
* Control weeds

**Note**: mulching is practiced during the **dry season**

Some important guidelines to mulching:

* Make sure that mulch do not cover the plants(help prevent disease)
* Remove weeds before spreading mulch

**Lesson 33** : Cover Cropping

**Outcome** : State the importance of cover cropping towards soil sustainability

**Cover crop**: maintaining ground cover

**What is cover cropping?**

* It is simply growing plants or crops of different sizes or species to help cover the soil surface and protect it from erosion

**Goals or importance of cover cropping**

* Slows weed growth
* Protect soil surface from raindrops and runoff
* Maintain soil structure
* Fix nitrogen
* Stops pests and disease

Examples of cover cropping practiced in Fiji

* Cocoa under coconuts ,pasture under coconuts, dalo under banana, yaqona under cocoa
* Vanilla under coconut
* Yaqona under calliandra(nitrogen fixing plant)
* Pasture grown under calliandra

**Lesson 34** : Strip Cropping

**Outcome** : State the importance of strip cropping in soil conservation

**Strip cropping** – small strips of land left uncultivated between the cropped areas to minimize water runoff

**How strip cropping helps in soil conservation**

* Creates natural dams for water
* Help to preserve strength of soil
* Plants will absorb minerals and water from soil more effectively
* Strips of soil will be strong enough to slow water down so soil is not washed away

**Soil Conservation : Activity**

Briefly explain how the following soil conservation methods control soil erosion:

Terracing

Mulching

Cover cropping

Name some crops that can be used in contour farming.

Practice mulching in your home garden.