

# AGRICULTURE

## GRADE 6 NOTES

### CONSERVING OUR ENVIRONMENT SOIL EROSION CONTROL

#### Meaning of soil erosion

- **Soil erosion** is the process by which topsoil is gradually removed from one place, transported and then deposited to another place by action of water, wind animals and human beings.

#### Types of soil erosion

1. Splash erosion
2. Rill erosion
3. Sheet erosion
4. Gully erosion

#### SPLASH EROSION

- Is the first stage in the soil erosion process by the action of water.
- When raindrops hit the bare ground, the soils broken into soil particles.
- The lighter soil particles are removed and splashed in various directions onto the soil surface by the force or energy of the raindrops.
- Therefore, small circular depressions can be seen where soil particles have been removed by splash erosion.
- Splash erosion occurs mainly during heavy rainfall that falls for short duration.
- Splash erosion causes more damage to soil on sloped land than flat land.
- The bigger Raindrops have more force or energy than smaller raindrops and therefore cause more splashing.
- Is also called **raindrop erosion** because it results from effect of raindrops on the soil.

#### Demonstrating splash erosion

Pupils activity

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#### Identifying splash erosion in the environment

Pupils activity

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## **SHEET EROSION**

- Sheet flow refers to a thin and uniform layer of moving water.
- Sheet erosion occurs when a thin layer of soil is removed uniformly by surface runoff on a flat or gently sloping bare land.
- Sheet erosion occurs when there is heavy rainfall that falls for a short duration
- In such situations, soil is unable to absorb much of the rainwater which therefore flows as surface runoff.
- The heavy raindrops splash soil particles while the surface run off carries the fine soil particles, carrying most of the nutrients.
- It is not easy to notice sheet erosion because the topsoil is removed evenly. By the time this type of erosion is detected, most of the topsoil will have been lost.
- Most common on recently cultivated land situated on smooth gentle slopes

### **Signs/indicators of sheet erosion are**

1. Stones below the topsoil are exposed.
2. Roots of plants including crops, grass and trees are exposed.
3. Eroded soil and crop remains are deposited at the lower areas of the slope.
4. Crop yields reduce season after season because of declining soil fertility.

## **Identifying splash erosion in the environment**

Pupils activity

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## **RILL EROSION**

- Rill erosion occurs in places where continuous sheet erosion has taken place.
- In such places, the runoff carrying soil particles concentrates in small channels or rills down a slope.
- Several small rills join to form a large rill
- As runoff flows along the rill, soil is eroded on the sides and the bottom of the rills.
- The rills reach a depth of up to 30 cm.
- Rill erosion can be observed when a freshly cultivated land experiences heavy rainfall immediately after cultivation.
- Rills can easily be removed during normal cultivation of land tools such as hoes and jembes.
- Rills can also be observed on overgrazed land as well as on paths created due to frequent movements by humans.

## **Observing rill erosion in our environment**

Pupils activity

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## **GULLY EROSION**

- Gullies are long deep ditches with steep sides
- They are mainly formed on steep slopes where rill erosion has taken place for a long time.
- As the runoff flows down the slope, it widens and deepens the rills, thus creating deep ditches.
- Gullies are not easy to remove by means of normal cultivation using tools such as hoes because of their great depth.

## **Identifying gully erosion**

Pupils activity

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## **Observing gully erosion in our environment**

Pupils activity

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## **METHODS OF CONTROLLING SOIL EROSION**

- To control soil erosion effectively, it is important that the soil surface is protected by suitable ground cover
- The ground cover controls splash by intercepting the rain drops before they hit the soil particles
- Ground cover also prevents sheet erosion by reducing the speed of runoff and therefore allowing most of the water to infiltrate into the soil.
- Ground covers include
  1. Cover crops
  2. Mulches
  3. Growing grass or vegetation on land and on drainage channels
- Trees also prevent the soil against erosion by wind in various areas especially in arid and semi-arid areas.
- Gabions or check dams constructed across gullies to trap the soil but allow water to pass through

### **Identifying methods of controlling soil erosion**

1. Cover crop
2. Contour ploughing
3. Strip cropping
4. Crop rotation
5. Conservation tillage
6. Avoid overgrazing
7. Reforestation
8. Improving drainage
9. Building terraces

## **Controlling soil erosion in our environment**

Pupils activity

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## **Importance of soil conservation in our environment**

1. It helps protect natural resources and water sheds, restores habitats for plants and wildlife, improves water quality and makes soil healthier.
2. Soil is one of the most valuable resources for any agricultural activity. We depend on it for food, employment and income. Some domestic animals also depend on soil for their pasture.

3. If soil is washed away, our land will be infertile, as a result water bodies will be destroyed and people can face hunger.
4. Take measures to prevent soil erosion by taking good care of the soil.
5. Apply appropriate soil erosion control measures if soil erosion has taken place. The measures will prevent further loss of soil and thus restore health and beauty of our environment

## **WATER CONSERVATION**

- It is preservation, control and development of water.
- You can conserve water by practising mulching, shading and cover cropping, sunken bed, shallow pits

### **Sunken beds**

- Sunken beds can be used in dry areas or during dry season.
- They can be used either as nursery beds or seedbeds.
- Because the base of the sunken bed is hidden away from strong sunlight and wind, the rate of heat loss is minimal.
- Sunken beds therefore conserve more moisture than flat or raised beds.

### **Preparing a sunken bed**

Pupils activity

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### **Shallow pits**

- Also called planting pits or zai pits
- Planting pits are used as method to prevent water runoff and thereby increase infiltration and reduce erosion
- The pits trap runoff and thus increase water infiltration into the soil.
- Mostly practiced in dry regions

### **Preparing shallow pits**

Pupils activity

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### **Importance of conserving moisture in a seedbed**

1. Leads to better and more reliable crop yields

## **LIVING BETTER WITH WILD ANIMALS**

- Repellents such as smoke, noise and certain smelly substances can keep off wild animals from our crops and domestic animals.
- Deterrents methods are used to prevent wild animals from damaging our crops and domestic animals. E.g. use of fence, use of light,

Pupils activity

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### **Using fences to keep away wild animals**

- Wire mesh fence and thick thorny bushes fence helps to keep wild animals away from crops and domestic animals

Pupils activity

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### **Using of innovative light to control wild animals**

- Animals fear random sounds deflecting and blinking or flashing lights.  These devices keep wild animals away at night from crops
- Light bulbs can be installed near cattle bomas or around the gardens

### **Planning how to make innovative deterrents**

Pupils activity

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### **Constructing innovative deterrents**

Pupils activity

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### **Making sound deterrents**

- Using a device that can produce some loud noise can also help to scare the wild animals

Pupils activity

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### **Making a bird feeding table**

- Safe traps can be used to trap some wild animals which then be released back to the forest.
- During the day birds can be kept away by hanging shiny reflective CDs or reflective ribbons such as shiny party streamers near the garden.
- The light reflected from the shiny surfaces of such objects distracts the vision of birds.
- The birds are also scared by sound reflective ribbons make when it is windy.

Pupils activity

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### **Importance of deterrents in conserving wild animals**

- Wild animals are important because they support our tourism industry which earns revenue for our country. They should not be killed when they come to our farms.
- Using deterrents helps us to live better or coexist with the wild animals in our environment.

## **CREEPING CROPS**

- **Creeping crops** are plants that naturally spread their weak stems horizontally on the ground rather than vertically.
- As stems of these plants spread, they produce new plants along the stem.
- Creeping crops can serve as good cover crops.

### **Identifying creeping crops**

1. Sweet potatoes
2. Strawberries plant
3. Watermelon plant
4. Pumpkin plant
5. Cucumber plant
6. Calabash plant

### **Planting materials for creeping plants**

#### **Identifying planting materials**

1. Seeds e.g. cucumbers, pumpkins, melons
  - The seeds are obtained from mature fruits of some creeping crops
  - Seeds can also be bought from reputable seed suppliers – agricultural research stations
2. Vegetative materials e.g. splits and vine cuttings
  - Planting materials for some creeping crops are mainly obtained from living parts of the same plants.
  - Vegetative planting materials can be obtained from farmers, agricultural training centres

Pupils activity

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### **Collecting planting materials**

Slasher/panga/jembe/rake/a shovel/manure

Pupils activity

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### **Planting creeping crops**

- A planting site should be prepared before planting the crops.
- Before planting the creeping crops, we should also prepare the planting materials for better establishment.

### **Preparing a seedbed**

1. Clear any vegetation on selected site
2. Dig the land to loosen the soil and remove all weeds.
3. Break all the large soil clods to obtain fine soil
4. Spread well rotten manure over the surface of the land. Mix the manure with soil
5. Level the seedbed

## **Preparing planting materials from seeds**

Knife/water/open container/mature fruit of a creeping crop

1. Cut a ripe fruit into two parts
2. Scoop out the seeds
3. Clean the seeds with cold water to remove pulp
4. Spread the seeds in an open container and dry them in the sun for a few days.
5. Select the good seeds for planting and store them in cool dry place.

**NOTE :** Seeds selected for planting should be clean, whole, free from insect damage, big in size and of uniform colour.

## **Preparing other planting materials**

- To raise new strawberry plants, a strawberry with many crowns is lifted from the soil and then broken into several parts called splits
- Each split has some roots, stem and leaves. It grows into a new plant once it is planted in a hole.
- Young vines of sweet potatoes are cut into several pieces each measuring 30 cm.
- Each of the vine cuttings will develop roots when the bigger part of it is buried in the soil.

## **Planting**

Pupils activity

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## **Care for young creeping crops**

1. Watering or irrigating the crops.
  - Water the crops when the weather is dry
  - Best time for watering the crops is early in the morning or in the evening when it is cool
  - Ensure that the soil is moist and not too wet
  - Avoid applying water directly on the leaves
  - Drip irrigation should be encouraged since it does not over wet the soil and leaves which can lead to fast spread of diseases.
2. Mulching the crops
  - Helps to conserve moisture as well as reduce weed growth
  - Also helps to obtain clean fruits since fruits do not touch the soil
3. Weeding
  - Remove weeds from time to time throughout the growing season.
  - When using tools to weed do not damage the roots, vines of the crop.
4. Protecting the crop from physical damage.
  - Make a structure to protect the creeping crops from damage by humans and animals.
5. Shading
  - Provide a shade in case it is very hot and dry during the growing season.
  - It helps to reduce wilting of crops due to too much evaporation and transpiration.
6. Top dressing with manures

- Apply organic manure around each crop at the base from time to time
- You can use compost manure from animals
- Adequate nutrients help creeping crops to grow fast and produce big leaves and fruits

7. Training the crops

- Build structure to support your vine crop to grow upwards.
- You can also train the young crop by moving the tip of the trailing vines to the desired place.
- Helps the plant to receive adequate sunlight and occupy small space within a given environment

### **Conservation project**

Managing creeping crops

Pupils work

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### **Responsibilities and care for creeping crops**

Pupils work

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### **Harvesting creeping crops**

- Creeping crops should be harvested when the produce is mature and ready for consumption or marketing.
- Harvesting the crop at the right stage is important because harvesting leads to wastage of the produce.

### **How to identifying the right stage of harvesting crops**

**crops**

Pupils activity

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### **How to harvest creeping crops**

- Produce from creeping crop should be harvested appropriately to avoid wastage
- Poor harvesting may lead to loses during harvesting

Pupils activity

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### **Harvesting and disposal of creeping crops**

**produce**

Pupils activity

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### **Value of creeping crops in our environment**

- Creeping crops are important because they provide food for our communities
- Watermelons, strawberries provide vitamins which protect us against diseases
- They are good sources of fibre which improves digestion
- Creeping crops protect the soil against erosion due to their trailing growth habit
- Creeping crops can be grown any time of the year. Many of them have no seasons. They can provide food security for our community.

Pupils activity

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