

**MINISTRY OF EDUCATION**  
**SECONDARY ENGAGEMENT PROGRAMME**  
**SEPTEMBER 2020**

**GRADE:** 8  
Science

**SUBJECT:** Agricultural

**Week 3**

**Lesson # 1**

**Topic:** Principles and Practices of Cultivation

**Sub-Topic:** Care and Maintenance of Crops

**Objectives**

Students will:

- correctly describe the methods of irrigation
- accurately state the role of nitrogen, phosphorus, and potassium in the growth of plants.
- explain the importance of mulching with little hesitation
- discuss weed and pest and disease control with minimal guidance.

**Content**

**Common Maintenance Operations**

1. Irrigation
2. Fertilizer Application
3. Weed Control
4. Pest and Disease Control
5. Mulching

**Irrigation**

- Is the artificial application of water to the soil to ensure an adequate supply of moisture to meet the crops needs.

- The amount and frequency of irrigation depend on the soil type, the kind of crop, stage of growth of the plant, the effective rainfall, the rate of evaporation from soil surface and on transpiration from plants.

## **Sources of Irrigation water**

1. Rivers
2. Streams
3. Lakes
4. Reservoirs
5. Springs
6. Shallow wells
7. Collecting rainwater from roofs

## **Methods of Irrigation**

### **Channel or furrow irrigation**

- Irrigation canals are built to convey the water from the lakes, rivers and wells to furrows or basins, through gravitation.
- In furrows only part of the surface area is wetted, in level basins the whole area is flooded.
- Furrow irrigation is adapted to soils of clayey or medium texture, where intake is medium or low and where the soil is deep and uniform and the subsoil does not impede drainage.



### **Sprinkler irrigation**

- Is more suitable where land is too steep. Topography is uneven or soils very permeable.

- In overhead sprinkle irrigation the water is pumped into distribution pipes from canals or reservoirs and water is applied through fixed or revolving nozzles spread at regular intervals.
- The rate of application should not be greater than 75% of the soil capacity to absorb.



### **Drip or Trickle irrigation**

- This method is very useful where water is in short supply.
- Water is supplied through PVC pipes lines to each row of plants and a small nozzle allows for water to drip out and maintain a moist zone around the plant roots.
- By this methods plants root zone may never be dry or waterlogged.



### **Links to Video on Irrigation**

<https://www.youtube.com/watch?v=amrCMakolKA>

### **Weed Control**

- A weed is any plant that is growing in a place where it is not wanted.

### **Harmful Effects of Weeds**

- They compete with crops for moisture, light, nutrients, and space.

- Harbours insect pest and disease organisms.
- Increase the cost of cultivation especially in the maintenance of irrigation and drainage channels.
- Some are poisonous to man and livestock.

### **Methods of Weed Control**

1. Hand pulling
2. Inter Tillage
3. Flooding
4. Mulching
5. Fertilizer and manure
6. Chemical control- contact nonselective weedicides
  - selective contact weedicides
  - systemic translocated weedicides



### **Links to Video on Weed Control**

<https://www.youtube.com/watch?v=QXeupnisDck>

### **Methods of Pest and Disease Control**

1. Physical
2. Mechanical
3. Biological
4. Cultural
5. Chemical



## Mulching

- Is the practice of having a layer of straw, leaves, compost, farmyard manure, pulverized corn cobs, peanut hulls, cotton seed hulls, wood shavings, sawdust, plant refuse, spreading paper or polythene sheets over the soil surface.
- It conserves soil moisture
- Suppress and destroys weeds.
- Helps regulate temperature in and around the plant.
- Adds organic matter to soil.
- Improve quality of produce.
- Increases water infiltration.
- Protects soil from erosion.



## Links to Video on Mulching

<https://www.youtube.com/watch?v=Bmlqzwmz39Y>

## Fertilizer Application

- Are frequently applied to the soil during land preparation.

**Major nutrients required by plants are:**

- Nitrogen which helps to build up vegetative parts of the plant, producing large green leaves. E.g. urea, ammonia
- Phosphorous which is necessary for cellular metabolism, assists in fruit set and seed development e.g. basic slag, rock phosphate.
- Potassium which helps in the formation of large rigid stems, and translocation of carbohydrates and disease resistance e.g. muriate of potash, sulphate of potash.



**Links to Video on Fertilizer Application**

<https://www.youtube.com/watch?v=lpj14zVmf0>

## Review

Complete the following Word Search

M	W	C	H	E	M	I	C	A	L	B	M
U	E	U	D	I	S	E	A	S	E	I	E
L	E	L	S	T	R	A	W	I	S	O	T
C	D	T	A	C	R	O	P	O	P	L	A
H	R	U	W	D	R	I	P	L	R	O	B
I	I	R	D	N	A	U	L	O	I	G	O
N	D	A	U	Y	I	R	A	G	N	I	L
G	G	L	S	T	N	E	N	I	K	C	I
P	E	S	T	E	A	A	T	C	L	A	S
C	H	A	N	E	L	R	O	A	E	L	M
F	E	R	T	I	L	I	Z	E	R	Y	C
I	R	R	I	G	A	T	I	O	N	S	A
M	E	C	H	A	N	I	C	A	L	P	B

IRRIGATION

WEED

SPRINKLER

RAINFALL

CHEMICAL

CULTURAL

MECHANICAL

STRAW

DRIP

PLANT

SAWDUST

UREA

DISEASE

PEST

CHANNEL

METABOLISM

MULCHING

FERTILIZER

## References

- Weever, et al (1993), Agricultural Science for Secondary Schools in Guyana, BK 2, Ministry of Education National Center for Educational Resource Development, Georgetown, Guyana. Chapter 1, pages 25-33.
- <https://www.youtube.com/watch?v=amrCMakolKA>
- <https://www.youtube.com/watch?v=Bmlqzwmz39Y>
- <https://www.youtube.com/watch?v=lpj14zVmf0>
- <https://www.youtube.com/watch?v=QXeupnisDck>