

# AGRICULTURE IN ZAMBIA

## GRADE 8 -2018

### SUB TOPIC

#### Agriculture practice and industry

1. Explain the importance of Agriculture in Zambia:

##### **Importance of Agriculture in Zambia**

- Food
- Employment
- Raw materials
- Income
- Foreign exchange
- Livestock feed
- Draught power and animal manure

2. state the importance of sufficient food production in Zambia:

##### **Importance of food production:**

- Food provision
- Food security
- Employment
- Provision of raw materials
- Income and foreign Exchange

3. Describe the role of Agriculture in the economy of Zambia:

- Raise income
- Food security
- Job creation

### SUB TOPIC

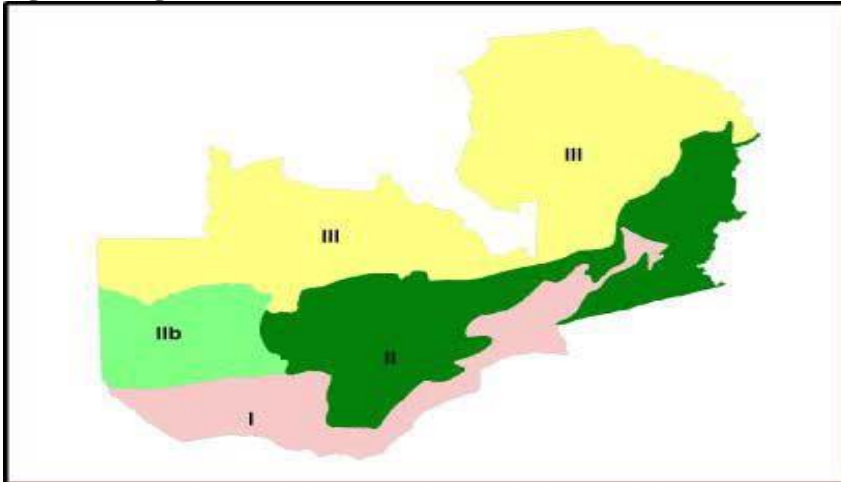
#### Agricultural activities in Zambia

1. Outline the main agricultural activities in Zambia

##### **Main agricultural activities:**

- Animal husbandry
- Crop husbandry
- Horticulture
- Irrigation
- Fish farming

- Bee keeping
  - Ranching (dairy and beef)
  - Forestry
2. Identify on a map of Zambia areas that are not suitable for dairy farming and ranching. Refer to tsetse fly infected areas on the map of Zambia thus-
- The Luangwa valley
  - Some parts of western
  - Luapula
  - Southern and central provinces
3. Identify on a map of Zambia the main Agro-ecological Regions of Zambia.



**Region 1-** covers Luangwa and Zambezi rift valleys.  
 Has unpredictable rainfall.  
 Average rainfall of more than 800mm per annum.  
 Have recurrent droughts and floods.  
 Temperature in summer can be more than 38° C

**Region 11- zone 11a**—consists of the central and eastern plateaus of the country.  
 Contains the most fertile soils in Zambia.  
 Receive 800- 1000mm rainfall and temperature in summer can be between 20 and

33° C

**Region 11- zone 11b-** includes the semi –arid plains of western province.  
 It has sandy and alluvial soils.  
 Rainfall can be more than 800mm per annum.

**Region 111-** covers the northern parts of Zambia.  
 Have acid –leached soils of relatively low fertility.  
 Receives more than 1200mm of rainfall per annum.  
 Temperatures in summer can be 18 -30° C

4. Identify on a map of Zambia areas that may not be very suitable for growing maize.
  - **Areas with northern plateau soils.**
  - **Areas with western windblown soils.**
  - **Stony soils of valley sides.**
  - **Areas with swampy soils and areas with flood plains soils.**

## **SUB TOPIC**

### **Factors that influence Agricultural Development**

1. Identify factors that influence the development of Agriculture.
  - **Climate,**
  - **Marketing**
  - **Education**
  - **Transport and road infrastructure**

2. Explain how the factors affect agriculture development  
**Effects of-**

- **Climate - Different types of crops grow well under different temperatures and rainfall ranges.**
  - **Transport – is needed to move inputs and produce to where they are needed.**
  - **Research- very important in agriculture, methods of communicating new findings to the farmer have been improved and expanded.**
3. Explain the need for farmers to diversify the production of crops and livestock.
    - **Need for farmers to diversify production of crops and livestock, this means growing of various crops and probably even rearing animals, helps the farmers to survive any decline in price or demand for the crops. Diversification saves farmers when one enterprise is attacked by a disease**
    - **Maximizing profits**

## **SUB TOPIC**

### **Farmer Support**

1. Investigate agencies and organizations that assist farmers in input procurement, marketing and agriculture extension.  
**Agencies and organizations that assist farmers.**

- **Inputs- input procurements e.g ZNFU, FISP and Comaco**
- **Marketing – functions are it advises on demand for requisites, inputs, and supply of produce from farmers. in the third republic the food reserve Agency and other organizations such as private companies buy produce from farmers**
- **Extension –involves officers from the ministry visiting the farmer to demonstrate and instruct them on method of increasing the production of crops animals**

## **SUB TOPIC**

### **Types of farmers**

1. Explain the differences between small scale and Commercial farmers.
  - **Small scale – farmer has small piece of farm (land), grow food enough to feed themselves and their families, farmer grows crops primarily for domestic consumption.**
  - **Commercial farmers – farmer grows crops to be used by family and the rest is sold to generate income, farmer produces more than half the agricultural produce in the country, uses improved seed and substantial quantities of fertilizer and pesticides**
2. Identifying the main Commercial farming areas in Zambia
 

**Main commercial farming areas in Zambia.**

  - **Found on the plateau areas and some others parts of the country, example eastern and western provinces,**

## **SOIL SCIENCE**

### **SUB TOPIC**

#### **Soil formation**

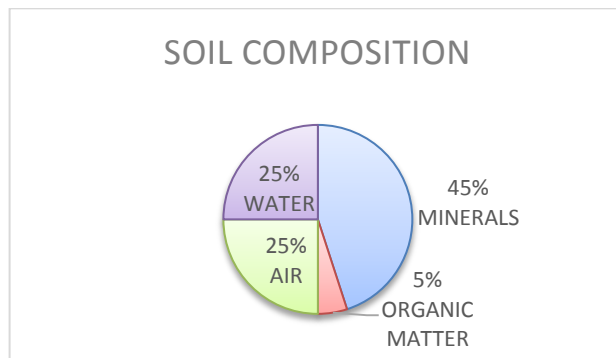
1. Explain the meaning of the term soil.
  - **Is the upper layer of the earth consisting of weathered rock particles, organic matter, air and water in which plants grow.**
2. Describe factors that are involved in soil formation.

- Soils come from rocks. Formed by the process of weathering. Weathering is the process by which the parent materials change to soil. It makes physical and chemical changes to soil, caused by factors responsible for breaking up of rocks and these include  
Water, wind, animal sand change in temperature

## SUB TOPIC

### Composition of Soil

1. Demonstrate the composition of soil.
  - **Organic matter (humus), mineral matter, water, air, living organisms.**



2. Explain the importance of soil components

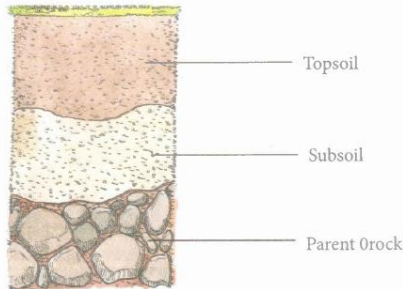
#### Importance of soil components

- **Humus - very fine organic material formed from organisms which once lived in the soil, helps soil to retain air, water and nutrients. It improves the structure of soil and heat absorbing capacity.**
- **Air – important for the respiration of the living organisms.**
- **Water- when water in the soil is not adequate, plants show symptoms of wilting, yellowing of leaves and stunted growth.**
- **Living organisms – make holes as they pass through the soil, thereby aerating it. They also cause the decomposition of organic matter into humus.**
- **Mineral matter-**

## SUB TOPIC

### Soil profile

1. Identify different layers of a soil profile.



**Soil profile -**

- **Top soil**
- **sub-soil**
- **parent rock**

2. Explain differences in soil profiles.

**O - horizon may contain leaves and stem litters, also referred to as the organic horizon.**

**A- Horizon contains partly decayed plant materials and humus that make soil dark.**

**B- Horizon contains either sand or clay. Colour of horizons varies in profiles of different places.**

**C- Horizon is the parent rock, most of the soil in the A and B - horizons was formed from the parent rock through a process called weathering.**

**R- Horizon consists of solid rock thus the rock that has not undergone weathering process.**

3. Explain the importance of top and sub-soils.

**Importance of -**

**Top soils -**

- **cultivation operations**
- **better aerated and has more active soil organisms**

**Sub soil -**

- **usually are more compact and less aerated than the topsoil**

4. Relate choice of crop to be grown on depth of layers of soil.

**Choice of crop and depth of soil layers**

- **Crops have different types of roots. Thus others have shallow root systems while others have deep root systems. Crops with fibrous roots such as maize and rice can grow.**
- **Crops with tap root systems such as oranges, guavas and other citrus fruits grow better.**

5. Relate the importance of the layers of soil to agricultural value of soil.

**Importance of soil layers to agricultural value of soil.**

- A farmer can know how suitable a soil is for agricultural purposes. The thicker the topsoil, the more nutrients the soil has for crop production
- farmer can tell how seriously eroded his / her soil is and measure to correct and prevent further erosion

## SUB TOPIC

### Soil texture

1. Explain the meaning of soil texture.

#### Meaning of soil texture -

- **Is the relative proportion of sand, silt and clay particles in a soil sample. Or coarseness or fineness of individual soil particles.**

## SUB TOPIC

### Types of soil

1. Identify different types of soil.

#### Types of soil:

- **Clay**
- **sand**
- **silt**
- **and loam**

2. Demonstrate the variation of water retention in different types of soil.

#### Water retention in different soils

- **Refer to clay soil, sandy soil and loam soil**

## SUB TOPIC

### Organic(manures) and chemical (artificial) fertilizers

1. Explain the difference between manure and chemical fertilizers.

- **Manures is a plant matter that has decomposed while fertilizers are artificial chemical containing nutrients in concentrated amounts with little or no organic matter.**

2. Distinguish between straight and compound fertilizers.

- **Straight is one which contains one element e g (urea, ammonium nitrate, phosphorus); while a Compound fertilizer is one which contains two or more elements e g(D- compound, X- compound )**

3. Identify fertilizers according to periods of their application.
  - **Basal applied during sowing or planting and top dressing fertilizers when crop reach nee height or flowering period in certain crops.**
4. Interpret the composition of fertilizers using the information on their containers.
  - **Composition of fertilizers: Refer to NPK meaning fertilizer has N-nitrogen 20%, P- phosphorus 10%, and K- potassium 5%.**
5. Determine quantities of fertilizer required by a crop given various ratios for various crops.  
**Quantities of fertilizer required for crops.**  
**Can be calculated using formula,**

$$\frac{\text{Nutrient content} \times \text{Total weight of fertilizer}}{100}$$

6. Explain the advantages and disadvantages of manure and chemical fertilizers.  
**Advantages and disadvantages of manure and chemical fertilizer**

**Merits of manure –**

- **improves the structure of the soil**
- **reduces runoff water**
- **support soil organisms**
- **increases ability of soil to absorb and retain more water**

**Demerits of manure –**

- **runoff water may carry manure applied to a field water such as river causing pollution**
- **difficult to estimate how much to apply**

**Merits of fertilizer –**

- **release nutrients in the soil quickly**
- **small amount is required and is in high concentration**

**Demerits of fertilizer-**

- **continuous use destabilizes the soil causing pan formation**
- **lead to acidification**

## **CROP PRODUCTION**

## **SUB TOPIC**

### **Classes and varieties of vegetables**

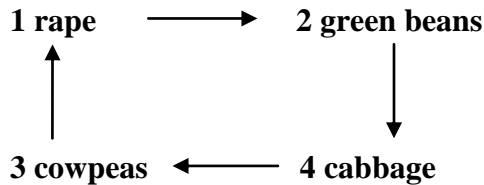
1. Identify vegetables according to groups
  - **leafy**
  - **legume**
  - **solanaceous**
  - **root**
  - **Cucurbit and miscellaneous.**
  
2. Name the varieties of each vegetable
  - leafy – rape, cabbage and chomollier
  - legume- beans and peas
  - solanaceous –egg plant, tomato and potatoes
  - root – carrot and beetroot
  - cucurbit –watermelons, cucumber and pumpkins
  - miscellaneous – leaks and onions
  
3. List factors that make a site suitable for vegetable growing.  
**Factors to consider**
  - **land level**
  - **water**
  - **away from big trees**
  - **Deep soil**
  
4. Explain the importance of factors that make a site suitable for vegetable growing.  
**Importance of factors that make a site suitable for a garden**
  - **Near home**
  - **Near source of water**
  - **On deep fertile soil**
  - **Fenced**
  - **Where there are no trees**
  - **On flat land**

## **SUB TOPIC**

### **Vegetable garden**

1. Draw a simple plan for vegetable growing.

**A plan for vegetable growing**



2. Explain the importance of vegetable rotation.

**Importance of vegetable rotation**

- helps to control weeds, pests and diseases
- helps to improve soil fertility

3. State the importance of a legume in vegetable rotation

**Importance of a legume in a vegetable rotation**

- Legume Plants has nodules on its roots in which bacteria are found that fix nitrogen in the form of nitrates in the nodules. Nitrates are released into the soil.

## SUB TOPIC

### Seedbed preparation

1. Demonstrate how to prepare plots and seedbed for vegetable growing.

**Preparing suitable plots and seedbeds for growing vegetables**

- Teacher to demonstrate how the seedbed is prepared details

2. Calculate and apply recommended quantities of manure and chemical fertilizer for a particular vegetable.

**Recommended quantities of manures and chemical fertilizers for vegetables**

**Manure on a quarter of a hectare of Irish potatoes can use the 10,000 -20,000kg**

$\frac{1}{4} \times 10,000\text{kg} = 2,500\text{kg}$

**Fertilizer compound D on a quarter of a hectare of Irish, can use 800 -1000kg**

$\frac{1}{4} \times 800\text{kg} = 200\text{kg}$

3. Demonstrate how to sow seeds correctly.

**Sowing seeds**

### Refer to page

4. Demonstrate how to transplant seedlings correctly.  
**Preparation of Seedlings for transplanting**

**Refer to grade 8 work**

## **SUB TOPIC**

### **Weed Control**

1. Explain the importance of weed control in vegetables.  
**Importance of Weed control**
  - **helps to reduce competition**
  - **helps control of pests and diseases**
  - **makes farming operations to be much easier and faster**
  - **eliminate poisonous weeds**
2. Describe the various methods of weed control in vegetables.  
**Methods of weed control**
  - **chemical use of herbicides**
  - **mechanical use of implements**
  - **cultural by cultural means natural**
  - **biological use of insects**
3. Demonstrate effective weed control methods for a studied vegetable.  
Effects of herbicides on the environment
  - Refer to effects pesticides on the environment
4. Observe the safety rules when applying chemicals in a garden.  
**Safety rules when applying chemicals**
  - **use protective clothing**
  - **wash after spraying**
  - **do not eat or smoke while spraying**
  - **store spray in original container**
5. Explain the effects of herbicides on the environment  
**Effects of herbicides on the environment**
  - **cause a build- up in the soil of herbicides**

- **Instead of killing weeds, soil organisms and useful insects such as bees may be destroyed. Some chemicals remain in the soil and washed into water courses and these are poisonous to fish.**

## **SUB TOPIC**

### **Pest Control**

1. Describe a pest.
  - **Pests – is an animal that causes damage to crop plants by feeding on them**
2. Identify pests in relation to crops they attack.
 

**Types of pests –**

  - **American bollworm -tomato**
  - **Aphid –mostly leafy crops**
  - **caterpillar – cabbage, rape and tomato**
  - **Eelworm – tomato, carrots and Irish potato**
3. Explain ways in which pests cause harm to crops.
 

**Harm caused by pests in crops**

  - **Feed on leaves, stem and flowers**
4. Demonstrate correct methods of controlling named pests in crops grown
 

**Controlling named pests in crops**

  - **by use of pesticides**
  - **crop rotation**
  - **avoidance**
  - **biological**
5. Describe natural pest control methods.
 

**Natural pest control methods**

  - **Are pesticides made from local materials in the environment e g ash and red paper,  
Ash, garlic**
6. Demonstrate how to mix and apply pesticides correctly.
 

**Applying pesticides**

  - **Make a solution of water and rogor (dimethoate) to spray vegetables**
  - **Use 20 liters of water. the rate of rogor is 4 to 6 ml /5 liters of water**
7. Explain safety rules when storing pesticides.
 

**Rules on storage of pesticides**

- **keep pesticides in lockable stores**
  - **keep pesticides containers clearly labelled**
  - **do not keep pesticides in food containers or bottles**
8. Explain the effects of prolonged use and excess pesticides on the environment.  
**Effects of excessive pesticides on the environment**
- **Refer to herbicides on the effects**

## **SUB TOPIC**

### **Disease Control**

1. Identify the symptoms of diseases on crops  
**Symptoms of diseases on crops**
  - **Dark brown leaves**
  - **Infected leaves roll upwards towards the midrib**
  - **Yellow colour on leaves**
  
2. Identify the crops attacked by diseases.  
**Crops attacked by diseases.**
  - **Beans**
  - **Tomato**
  - **Potato**
  
3. Explain methods of preventing disease attack on the crops.  
**Prevention of disease attacks.**
  - **Application of fungicides**
  - **Early planting**
  - **Crop rotation**
  - **Planting resistant varieties**

## **SUB TOPIC**

### **Harvesting and marketing**

1. Identify the signs of readiness for harvesting the crop  
**Signs of readiness for harvesting.**
  - **Yellowing and drying of the whole plant like in maize**
  - **Dark makings on seeds like in groundnuts**
  - **Drying of the whole plant after maturity in certain crops**

2. Demonstrate how to harvest and prepare vegetables for marketing.

**Harvesting and preparation of vegetables.**

- **Some crops are harvested while fresh like green beans**
- **Others harvested while they are dry**
- **Many types of vegetables have different harvesting methods**

3. Describe how to price each Vegetable grown.

**Pricing vegetables for marketing**

- **Pricing of vegetables goes with the grades, large, medium and small and how clean the vegetables are**

4. Calculate the profit or loss

**Calculation of Profit/Loss**

- **Farmer can find out whether he/she has made a profit by finding the difference between the total cost of producing the vegetables and the amount obtained by selling it**

5. Describe how to Store vegetables correctly

**Storing vegetables**

- **Green vegetables do not store well- they are perishable but can be stored in a cool place**

## **FORESTRY**

### **SUB TOPIC**

#### **Importance of trees in soil management**

1. Explain the role of trees in soil erosion and infiltration of water.

**Role of trees -**

- **Control Soil erosion reduction and infiltration of water into the soil.**
- **Reduce the impact of rain drops on soil**
- **Roots of trees hold soil together**

2. State the role of trees in soil fertility improvement.

**Role of trees in soil fertility improvement**

- **some trees are legumes and have nodules on their roots and are capable of fixing nitrogen in the soil thus enriching the soils with nutrients**

3. Identify trees used to make handles and poles.

**Trees for making handles and poles.**

- **monkey bread**
- **Acacias species**

- **Eucalyptus grandis**
  - **African ebony**
  - **Sickle bush**
4. Explain how you can ensure continued supply of poles and handles from the trees.  
**Ensuring continuous supply of handle and poles**
- **By ensuring more trees are planted and the preservation of indigenous wood lands must be done**

## **SUB TOPIC**

### **Selecting a site for growing trees**

1. Identify factors which make an area suitable for growing trees  
**Factors that make an area suitable for raising trees.**
  - **Level land or flat land**
  - **An area without heavy frost**
  - **Deep soil**
  - **Well drained soil that is free from water logging**
  - **Adequate rainfall of a minimum of 700mm of rainfall per annum**
2. Explain the importance of the factors that make the area suitable for growing trees.  
**Importance of factor**
  - **Choosing a site for growing trees need to have adequate water for tree to grow well**
  - **Soils need to be well drained as water- logged soil lead to withering of trees since they would not get adequate air from soil**
  - **Area need to have deep soil so that there is good anchorage for the roots**
  - **Area should be even to reduce soil erosion from wind and runoff water**

## **CONSERVATION FARMING**

### **SUB TOPIC**

#### **Mixed cropping**

1. Describe conservation farming  
**Meaning of conservation farming**

- means growing crops while also ensuring that the environment and especially the soil is not degraded
2. Describe mixed cropping.

#### **Mixed cropping.**

- Is the growing of two or more types of crops on the same piece of land at the same time thus growing of legumes, grains and cucurbits

3. Explain the role of mixed cropping on soil fertility.

#### **Mixed cropping and soil fertility**

- It provides the soil cover thus reducing loss of soil through soil erosion. There are also mutual benefits that are derived from the two crops. e.g. maize provides stakes for leguminous crops while leguminous crops will provide nitrates in the soil for other crops to use

### **SUB TOPIC**

#### **Inter cropping**

1. Describe intercropping.

#### **Intercropping**

- is the planting of crops in the same season on the same piece of land. intercropping refers to alternate rows of crops, e.g. rows of maize with one or two rows of soya beans in between

#### **Importance of intercropping to soil fertility**

- The ground is covered with growing plants for nearly the whole year thereby giving protection to the soil against fast evaporation of water by direct heat from the sun.
- Also protects the ground from soil erosion by wind and water

### **SUB TOPIC**

#### **Mixed farming**

1. Describe mixed farming.

#### **Mixed farming**

- Is the growing of crops and rearing of animals on the farm

2. State the role of mixed farming in soil fertility

**Mixed farming and soil fertility**

- **Mixed farming enrich the soil with some nutrients**
- **it adds microbes into the soil and provides them with food**

**SUB TOPIC**

**Land clearing and preparation**

1. Describe the use of a suitable hoe in clearing the land for conservation farming.  
**A hoe is used to clear land and in making planting stations**
2. Demonstrate how to make ridges in conservation farming using a hoe  
**Preparation of soil using a suitable hoe.**

- **A hoe is used in making of ridges**

**Making ridges using a suitable hoe.**

- **A hoe is used in making of ridges in high rainfall areas. a suitable hoe should be used in making the ridges depending on the type of soil in the area**

**SUB TOPIC**

**Chemical fertilizer and manure application**

1. Apply chemical fertilizer and manure correctly under conservation farming  
**Application of chemical fertilizer and manure in conservation farming**

**SUB TOPIC**

**Planting and weed control**

1. Plant correctly using a suitable tool.

**Planting correctly**

- **Using a hoe by ensuring that the soil is left undisturbed. Soil should only be disturbed by the hoe where the seeds are placed. A hoe is used to dig appropriate holes where the seeds of the crop will be sown, leaving the rest of the soil undisturbed**

2. Control weeds appropriately in a crop grown under conservation farming.

#### **Controlling weeds under conservation farming.**

- **Early and continuous weeding is carried out during the crop growing season**
- **Do not allow weeds to grow beyond 5-6 cm high in the field before removing the.**

### **SUB TOPIC**

#### **Soil Erosion Control**

1. State how to control soil erosion using vetiver hedges

##### **Soil erosion control using vetiver hedges**

- **Protect soils from been washed away by rains because of its roots help to hold the soils and leaves covers the ground**
3. Plant vetiver hedges correctly.
    - Planted into furrows along the side of every 15<sup>th</sup> ridge. Planting of this grass should be done between mid December and January when there is enough moisture for the grass to grow

### **LIVESTOCK PRODUCTION**

#### **SUB TOPIC**

##### **Importance of livestock**

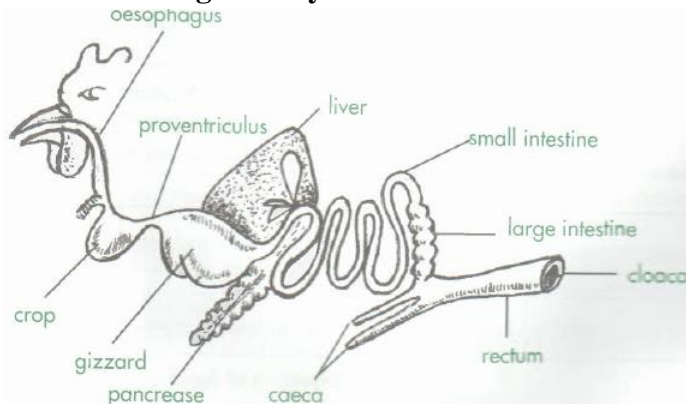
1. Describe the importance of livestock in Zambia.
  - **Fighting malnutrition**
  - **Income generation**
  - **Soil fertility**
  - **Draft power and provision of hides and skins**

#### **SUB TOPIC**

##### **Parts of Digestive systems**

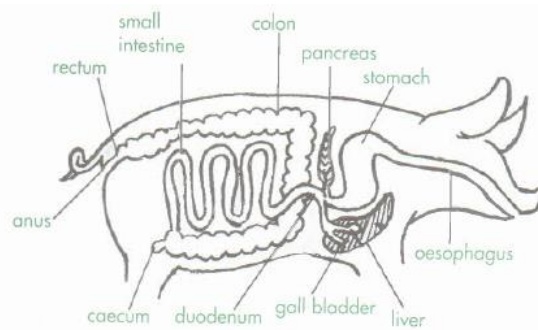
1. Identify parts of the digestive system of a bird and a pig;

### Parts of the digestive system of a bird:



- **Beak**
- **crop**
- **proventriculus**
- **gizzard**
- **intestines**
- **cloaca**
- **vent**

### Pig



- **mouth**
- **esophagus**
- **stomach**
- **duodenum**
- **small intestine**
- **large intestine**
- **rectum**
- **anus**

2. Describe the functions of the parts of the digestive systems of the animals studied

### Functions of parts of the digestive system of a bird

- **beak** - for picking up food particles
- **crop**- stores food for a while and moisten
- **proventriculus** – beginning of chemical digestion
- **gizzard** – ground food into small pieces by action of muscles in the gizzard
- **intestines** – where digestion is completed and end products are absorbed into the body
- **cloaca** – digestion of cellulose may occur and water and by – products of microbial digestion are absorbed

### And pig.

- **mouth** - organ for food ingestion
- **esophagus** – food passage from mouth to stomach
- **stomach** – stores food temporarily and secretes gastric juice onto it
- **duodenum** – mixes chime with bile and pancreatic juice and digestion of proteins
- **large intestine** – reabsorbs water from undigested part of the food mixture
- **rectum** – receives and temporarily stores waste products
- **anus** – exit point of digested food as dung

3. Compare the digestive system of a bird and that of a pig.

### Digestive system of a bird and pigs

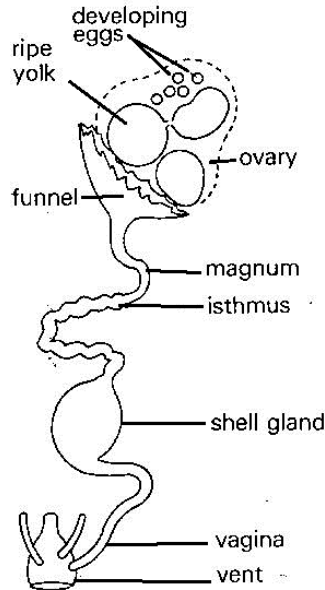
<u>Chicken</u>	<u>pig</u>
<b>Beak</b>	<b>mouth</b>
<b>Esophagus</b>	<b>esophagus</b>
<b>Crop</b>	<b>-</b>
<b>Proventriculus/ gizzard</b>	<b>stomach</b>
<b>Duodenum</b>	<b>duodenum</b>
<b>Pancreas</b>	<b>pancreas</b>
<b>Liver</b>	<b>liver</b>
<b>Small intestine</b>	<b>small intestine</b>
<b>Large intestine</b>	<b>large intestine</b>
<b>Caeca</b>	<b>rectum</b>
<b>cloaca</b>	<b>anus</b>

### SUB TOPIC

## Parts of the reproductive systems

1. Identify and label the parts of the reproductive system of a female bird.

### Parts of the reproductive system of a female bird



-+

2. Explain the importance of the reproductive system of a female bird

### Importance of the reproductive system of a female bird

- It is important that fertilization takes place as the ovum reaches the oviduct

3. Explain the functions of the parts of the female reproductive parts of a female bird.

### Functions of parts of the reproductive system of a female bird.

#### Parts function

**Ovary**

**produces eggs**

**Funnel**

**catches eggs from the ovary**

**Oviduct**

- upper most part next to funnel
- middle part
- third region

- produce albumen
- produces membranes
- produces shell

**Vagina**

- keeps the egg for a few Seconds on its way out

## SUB TOPIC

### Breeds

1. List the various breeds of poultry studied

#### Breeds of poultry

- Arbor Acre “ Harco”
- Sykes “H3”
- Syke “Brown”
- Warren Standler

2. Name some of hybrid poultry hatcheries in Zambia.

#### Some hybrid poultry hatcheries in Zambia

- Hybrid poultry
- F and G Sykes (Zambia ltd)
- Caledonian hatcheries limited

## SUB TOPIC

### Brooder house

1. List the characteristics of a good poultry house

#### Characteristics of a good poultry house

- Ventilation
- protection from rain
- protection from predators
- Easy to clean etc

2. State the floor space to house Poultry of different ages.

#### Floor space to house poultry of different age

<u>Bird</u>	<u>Age</u>	<u>Floor space in m2 / bird</u>
Chicks	1 -4 days	0.02
	4 day	brooder surround is extended.
	7 – 10 days	brooder surround is removed
Grower	3 weeks	0.2



## **Incubation of eggs and Brooding**

1. State the principles of Incubation.

### **Principles of incubation**

- **Naturally**
- **Artificially**

2. Recall the right temperature for chicks in a brooder house.

### **Temperature in the brooder house**

- Temperature should be 250°C

3. Brood day old chicks.

### **Day old chicks in the brooder house**

- **Teacher to demonstrate how to make and brood day old chicks**

## **SUB TOPIC**

### **PESTS AND DISEASES**

1. Identify pests of poultry Studied

#### **Pests of poultry**

- **Mites**
- **Lice**

2. Explain ways pests cause harm to poultry.

#### **. Harm caused to poultry by pests**

- **Suck blood on the host and birds attacked by lice are poor health and may eventually weaken and die**

3. Prescribe correct methods of controlling pests in poultry studied.

#### **Controlling pests on livestock.**

- **Disinfecting poultry pens suitable disinfectants**
- **Spraying**
- **Dipping**
- **Dust bathing**

4. Identify diseases of poultry studied

#### **.Livestock diseases.**

- **New castle**
- **Fowl pox**

- **Coccidiosis**
  - **Fowl typhoid**
  - **Gumboro**
  - **Mareks disease**
5. Prescribe correct methods of controlling diseases in poultry studied.

**Methods of controlling diseases in livestock.**

- **By regular vaccinations**
- **Disinfection of pens**

**SUB TOPIC**

**RECORDS AND MARKETING**

1. Maintain proper poultry records.  
**Poultry records**

- **Record keeping enables the farmer to work out the profit and loss of an enterprise. records can be grouped into two classes, recurring and layers records such as**

**Layers records can include**

- i) **number and value of hens as they start laying**
- ii) **number of eggs collected per day**
- iii) **daily food consumption**
- iv) **labour and medicine costs**
- v) **number of dead and culled hens**

2. Collect, store and market eggs correctly  
3.

- **Collecting – clean eggs should be collected at least twice a day**
- **Storing – store eggs in a cool and clean place free from chemicals at 13<sup>0</sup> C**
- **Marketing – sort and grade eggs according to size and colour and ensure that eggs are clean before taken for sale**

4. Prepare birds for marketing

**Preparing a bird for marketing.**

- **chicken has to be slaughtered and hung in cool place, head down wards for 24 hours, then drawing of skin is done, head is cut off close to the body then the**

**inner parts are removed out and the carcass is cleaned, the carcass is packed in a plastics bag ready for sale**

## **FARM STRUCTURES**

### **SUB TOPIC**

#### **STORAGE OF VEGETABLES**

1. Describe an appropriate storage facility for vegetables.

##### **Preparing vegetables for storage**

**Different vegetables require different ways of storing them, only enough vegetables for consumption or marketing should be harvested as green vegetables are perishable.**

- **green vegetables be stored in a cool and well ventilated area with humidity to reduce evaporation of water**
  - **lifted carrot should be stored in cool, dry and well ventilated facilities out of direct sun**
2. Demonstrate how to prepare vegetables for storage

##### **Preparing vegetables for storage.**

- **Most vegetables are perishable – they do not store well**

### **SUB TOPIC**

#### **POULTRY HOUSES**

- 1 Describe appropriate houses for day old chicks, grower, finisher, point of lay and layer.

##### **Appropriate houses for**

- **Day old chicks - brooder**
  - **Grower – deep litter house**
  - **Finisher – deep litter house**
  - **Point of lay – deep litter house**
  - **And layer – battery cages**
2. Plan an appropriate house for a given group of birds.

##### **Plan for a poultry house**

- **Teacher to explain to pupils**

3. Construct a model of an appropriate house for a given group of poultry.

##### **Models of houses for a given group of poultry.**

- **Teacher to demonstrate to pupils**

## FARM MACHINERY

### HAND TOOLS

- 1 Identify some hand tools used at the farm.

#### Hand tools used at the farm

- trowel
- spade
- gardening fork
- mattock
- watering can

- 2 Demonstrate the proper use of hand tools.

#### Uses of hand tools

Tools should be used only for the purpose for which it was made -

- trowel – loosening soil, digging holes and scooping seedlings from seed beds
- spade – moving soil as well as digging hard stony soil
- garden fork – turning litter and loosening soil
- mattock – digging hard ground and cutting wood
- water can – for carrying water and watering

- 2 Demonstrate the proper care for hand tools

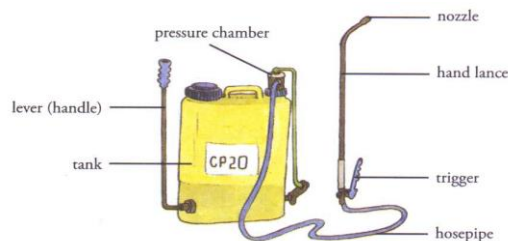
#### Care for hand tools.

- keep all tools clean, oiled and ready for use
- keep all tools under cover to avoid damage from, e.g. weather and animals
- using each tool for the purpose it was designed
- always keep tools in the tool box after use

## SUB TOPIC

### SPRAYER

1. Identify major parts of a hand sprayer



#### Identifying major parts of a hand sprayer.

- tank
- nozzle
- handle
- pump

#### Functions of major parts of a hand sprayer.

- tank – for storage
- nozzle – used for releasing a fine spray to the required target
- handle – move up and down to operate a piston that forces the pesticides up the barrel and into the rubber hose
- pump – builds up pressure inside the tank

### SUB TOPIC

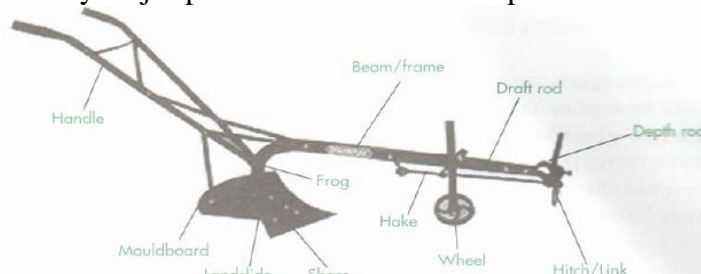
#### ANIMAL DRAWN IMPLEMENTS

1. Identify animal drawn implements

##### Animal drawn implements:

- Plough
- cultivator
- ripper
- ridger
- planter

2. Identify major parts of animal drawn implements.



##### Major parts of animal drawn implements.

- share
- beam
- mould board
- wheel
- link

3. Explain the functions of major parts of animal – drawn implements.

##### Functions of major parts of animal drawn implements.

- **share – cutting furrow slices**
- **beam – holds other parts of the plough together**
- **mould board – for turning furrow slices and burying vegetation**
- **wheel – for adjusting ploughing depth and reducing resistance while ploughing**
- **link – linking the plough to a chain pulled by animals**

## **SUB TOPIC**

### **STORAGE FOR FARM MACHINERY**

1. Prepare hand tools for Storage

#### **Preparing hand tools for storage.**

- **wash and clean after using**
- **store in cool dry place**
- **apply oil**

2 Choose an appropriate facility for storing hand tools.

- **Appropriate facility or storeroom for storing hand tools**

3 Describe an appropriate facility for storing animal drawn implements.

#### **Appropriate facility for storing animal drawn implements**

- **store in dry cool place**
- **clean and oil after use for proper storage**
- **apply oil**

4 Prepare animal drawn implements for storage.

#### **Preparing animal drawn implements for storage**

- **clean after use and store in a dry place**
- **apply oil**

5 Demonstrate the proper care for animal drawn implements

#### **Care for animal drawn implements**

- **Teacher to demonstrate to pupils proper care of implements**

## **FARM MANAGEMENT**

### **SUB TOPIC**

#### **FARM MANAGEMENT**

JUNIOR AGRIC SCIENCE COMMON NOTES- IN MUCHINGA PROVINCE

- a. Describe farm management.

Farm management

- Involves careful forward planning and utilization of resources of land and labour. It calls for a manager to have knowledge of market. It's important to bear in mind that regardless of the size of the farm, good management is important

## **SUB TOPIC**

### **AGRICULTURAL ECONOMICS**

1. Describe agricultural Economics

**Agricultural economics.**

**Is the study of how limited resources (land, capital and labour) are used to produce crops or animals on a farm? It's not possible to produce unlimited supplies of goods on a farm. This is because the resources on a farm are limited. This makes it imperative to make a choice about the use of the resources on the farm**

## **SUB TOPIC**

### **OPPORTUNITY COST AND PRODUCTION DECISION**

1. Describe the term opportunity cost.

**Opportunity cost.**

- **refers to limited resources where there is need to make a choice meaning we choose to do one thing e.g. if we choose to grow groundnuts on a piece of land that could also be used to produce sorghum, then we miss or forgo the chance to grow sorghum**

2. Explain the term production decision in Agriculture

**Production decision**

**Farmer need to make important decision as -**

- **what to produce**
- **how to produce**
- **how much to produce**
- **how and when to buy and sell**

## **SUB TOPIC**

### **TYPES OF CREDIT**

1. Describe the types of credit available in Agriculture.

#### **Types of credit available in Agriculture**

- **short term – repaid after one or two years can be used to buy inputs such as seeds and fertilizers**
- **medium term loans – repaid over a period of three to five years this type can be used to buy agricultural machinery**
- **long term loans – repaid over ten years to fifteen years this enable farmer to buy land**

### **SUB TOPIC**

#### **INTEREST**

1. Explain the term interest

##### **Interest**

- **Is a charge imposed on borrowed money over a specific period of time**

- 2 Explain the difference between simple and compound interests

- **Simple interest and compound interest. Calculating simple and compound interest , For example find interest on ZMK 5,000,000 for 2 years at 5% per annum**

$$\text{ZMK } 5,000,000 \times 5/100 \times 2 = \underline{\text{ZMK } 500,000}$$

**With compound interest – interest attracted by the loan in the previous year is added to the principal and for the next and subsequent periods thus**

$$\text{ZMK } 5,000,000 + 500,000 = \underline{\text{ZMK } 5.500,000}$$

### **SUB TOPIC**

#### **RECORDS**

1. Explain the importance of various financial documents.

**Importance of financial documents: refer to Receipts, Invoice, delivery note and purchase order.**

- **on whether profits or losses are being made**
- **help the famer to be assessed for current taxation**
- **help the famer to decide on or be assessed for credit**

- on history of the farm
- helps in making insurance claims
- help in farm planning and budgeting

2 Prepare production records.  
**Preparing production records**

<b>CROP;</b>	<b>YEAR;;</b>
<b>Spacing</b>	<b>seed rate</b>
<b>Date planted;</b>	<b>date harvested;</b>
<b>Yield;</b>	
<b>Remarks;</b>	

2. Prepare financial records.  
**Preparing financial records**

- **Refer to farm receipt for sales of eggs and vegetables**

## **SUB TOPIC**

### **ENTERPRISE**

1. Describe the term enterprise.

#### **Enterprise**

- **Is a business unit on the farm, example of farm enterprises are cabbage, beans, rape, broilers, layers and so on**

3 Explain gross output and gross margins of an enterprise.

## **Gross output and gross margin of an enterprise.**

- Teacher to explain to pupils how to calculate the gross output and gross margin in details

### **SUB TOPIC**

#### **GRADING AND STANDARDISATION**

1. Explain the term grading.

##### **Grading**

- **Is a process of sorting agricultural produce or products into different classes or grades according to type, colour, quantity and size? it enables the produce or products of the same class or grade to be sold in uniform parcels**

2. Explain the term standardization

##### **Standardization.**

- **Is the establishment and application of measurements thus this can be quality or quantity**

- 3 Grade produce from an enterprise.

##### **Grading produce –**

- **process of sorting agricultural produce or products into different classes or grades according to type, colour, quality and size**

## **GRADE 9**

### **Topic**

#### **AGRICULTURE IN ZAMBIA**

### **SUB TOPIC**

#### **Agriculture practice and industry**

- 1 Identify the importance of functional practical work

- Helps to develop practical skills in the practicing farmers
- Create jobs on the farmers thus reducing on unemployment in the country
- Leads to greater farm production
- Eliminate laziness among farmers who become hardworking as a result of functional practical work

- Helps farmers to be practical -oriented in agricultural production and this makes them more innovative
- 2 Learning through doing and practicing approved methods of farming
    - Teacher to explain to pupils
  - 3 Investigate interdependence between agriculture and industry  
.Agriculture and industry
- Agriculture provides raw materials to agro -based industries.  
Examples -  
Timber is taken to paper industries to make paper
  - Agriculture provides food to workers in industries
  - Workers in industries buy agricultural products from farmers
  - Agricultural exports earn foreign exchange which is based to import industrial machinery

## SUB TOPIC

### 1. EFFECTS OF HUMAN POPULATION ON AGRICULTURE.

1. Describe the effects of rapid population growth on arable and ranching land.  
**Effects of rapid population growth on arable and ranching land.**
  - **Results to land fragmentation**
  - **Results in soil erosion**
  - **Results in Low agricultural output**
  - **Because of lowered soil productivity**
  - **Results into subsistence agriculture**
  - **May force an influx of people to encroach on gazetted forests, wetland, parks and game reserves**
- 2 Explain the effects of rapid population growth on the marketing of agricultural produce/products.  
**Effects of rapid population growth on the marketing of agricultural produce/products.**
  - **Increases demand for agricultural products or produce**
  - **May cause increase in the prices of agricultural produce or products due to increased demand**
  - **More people engaged in trading agricultural produce or products to earn living**

## **SUB TOPIC**

### **FARMING AREAS IN ZAMBIA**

- 1 Describe the general conditions that favour arable farming and ranching.

#### **General conditions that favour arable farming and ranching**

- **Good soil**
- **Favorable climate**
- **Development infrastructure**
- **Marketing**
- **Extension service**
- **Financial support**
- **Security**
- **Effective pests and disease control**
- **Growing suitable crop cultivars and raising suitable livestock breeds**

## **SOIL SCIENCE**

### **CHARACTERISTICS OF SOILS**

1. List the characteristics of clay, sand and loam.

#### **CHARACTERISTICS OF CLAY**

- **Rich in plant nutrients**
- **Have a high capillarity**
- **Have a very fine texture when wetted**
- **Have porosity which makes them poorly drained and poorly aerated**
- **Composed of very tiny particles which easily stick together**

#### **SAND SOILS**

- **Well aerated and well drained**
- **Low in plant nutrients due to leaching**
- **Warm up quickly after a rainy season**
- **Have very low capillary**
- **Have coarse texture because the particles are large**

#### **AND LOAM SOILS**

- **Have a moderate capillarity**

- **Contain large quantities of humus**
- **Are moderately textured**
- **Have a suitable PH range**
- **Cannot be waterlogged because of high content of humus which improves porosity**

2. List the characteristics of humus.

#### **Characteristics of Humus**

- **Provides food and shelter to beneficial soil organisms**
- **Retain soil heat which required for seed germination**
- **Source of organic acids that help to dissolve parent rock to form soil**
- **Improves water holding capacity**
- **Improves soil aeration and drainage by improving soil porosity**

#### **SUB TOPIC**

#### **SOIL STRUCTURE**

1 Identify soil with good structure.

#### **Good soil Structure.**

- **Good aeration**
- **Good drainage**
- **Moderate erodibility**
- **Good nutrient retention capacity**
- **Water retention capacity**

2 Explain how to maintain good soil structure.

#### **Maintaining good soil structure.**

- **Application of organic manure**
- **Fallowing**
- **Afforestation/ agro forestry**
- **Mulching**
- **Cover cropping**
- **Liming**
- **Mixed cropping**

#### **SUB TOPIC**

#### **PLANT NUTRIENTS**

1. Classify nutrients.

#### **Major**

- **Nitrogen**

- Calcium
- Carbon
- Oxygen
- Hydrogen
- potassium

And minor nutrients.

- Zinc
- Copper
- Boron
- Iron
- chlorine

2. Describe the importance of nutrients.

**Importance of major**

- **Nitrogen** - formation of chlorophyll  
- encourage vegetative growth  
- Formation of fruits and seeds
- **Calcium** - modifies soil PH  
- strengthen plant stems  
- encourages root development and growth
- **Hydrogen** - for photosynthesis

And minor nutrients.

- **Zinc** - help in seed germination  
- activate some plant enzymes
- **Copper** - activates certain plant enzymes
- **Chlorine** - necessary for chlorophyll

**SUB TOPIC**

**MANURES AND ASHES**

1 Explain how dead animals and plant materials are broken down to form humus

**Formation of humus through breaking down of dead matter.**

- **Dead animals and plant material are added to soil, microbial activity starts. microorganisms consisting of bacteria and fungi multiply rapidly and the microbial activity hydrolyses and oxidizes organic compounds to produce ammonium, phosphate nitrates and others thus forming mineralization .the synthesized microbial cell die and decompose thus mineralizing the immobilized nutrients. therefore, decomposition product left behind is humus**

2. Investigate the nutrients content of rabbit, chicken, sheep, duck, cow and pig manures.  
**Nutrient content of rabbit,**

- **Nitrogen**
- **Potassium**
- **phosphorus**

**Chicken,**

- **Nitrogen**
- **phosphorus**

**Sheep, duck, pig and cow manures**

- **Answers some as with rabbit and chicken manure**

3. Compare the nutrient content of ashes to that of manure.  
**Nutrient content of animal manure and ash.**

- **Ashes and manure have similar nutrients e g sulphur, calcium, potassium, phosphorus and differ in other nutrients like magnesium, iron and zinc**

4 Explain soil infertility.  
**Soil fertility: refer to the nutrient content.**

- **Is the inability of the soil to support crop growth due to lack of necessary nutrients**

## **SUB TOPIC SOIL REACTION**

1. Explain the causes of soil acidity and alkalinity.  
**Soil acidity**

- **Rainwater**
- **Rocks**
- **Cultivation**
- **Leaching**
- **Fertilizer application**

**And alkalinity.**

- **Addition of basic fertilizers**
- **Rocks also causes soils to become alkaline**
- **Application of irrigation water containing large amounts of which raises the sodium bicarbonates which react with soil compounds to form basic compounds which raises the soil PH thus causing soil alkalinity**

2 .Demonstrate the correction of very high acidity and alkalinity.

**Correction of soil acidity**

- **Liming the soil**
- **Application of basic fertilizers into soils**

**And alkalinity.**

- **By applying sulphur**
- **Application of organic matter like farm yard manure, compost, green manure and dung**

## **SUB TOPIC SOIL EROSION**

1. Explain causes of soil erosion

- **Overgrazing**
- **deforestation**
- **cultural practices**
- **land use**
- **Burning of land**

2 Describe the effects of soil erosion.

**Effects of soil erosion**

- **Takes away of soil nutrients**
- **Leads to low yields because soil erosion causes soil infertility**
- **Pollutes wetlands**

- Destroys crops by uprooting and breaking them
- Removes soil layers and may create gullies in fields

2 Describe the prevention of soil erosion.  
**Prevention of soil erosion.**

- Mulching
- Crop rotation
- Afforestation
- Windbreakers
- Mixed cropping
- Deep cultivation

## **CROP PRODUCTION**

### **SUB TOPIC**

#### **IMPORTANCE OF THE CROP**

1. Investigate the nutritional and economical value of the crop.

##### **Nutritional**

- Source of dietary fibre
- Potassium
- Phosphorus
- Vitamins C, B, A

##### **And economic value of crops.**

- Earn foreign exchange
- Income to farmers

2. List the ways in which the crop is used.

##### **Uses of the crop maize**

- Used to make livestock feed
- Human consumption and others
- Used as litter in poultry houses
- Used as animal beddings

### **SUB TOPIC**

#### **ECOLOGICAL REQUIREMENTS OF THE CROP**

1 List the ecological requirements of the crop  
**Ecological requirements of the crop.**

- **Requires fertile soil**
- **well drained soil**
- **loamy soil**
- **with PH range value of 6 to 7**
- **Average temperature of 24 °C**
- **Performs well with 600mm to 900mm of rainfalls during the growing period**

**SUB TOPIC**  
**VARIETIES AND PROPAGATION**

1 Identify the varieties of the crop.

**Varieties of the crop.**

- **SEEDCO 727**
- **SC 719**
- **SC 707**
- **ZMS 528**
- **ZMS 402**

2. List the advantages and disadvantages of various methods of propagation.

**Advantages**

- **Easily mechanized**
- **Easy to mix with storage chemicals for safe storage**
- **Seeds can remain viable for long until the time of planting**
- **Cheaper to store, transport and more convenient to use than vegetative materials**

**And disadvantages of various propagation methods.**

- **Teacher to explain to pupils the disadvantages of propagation**

**SUB TOPIC**  
**SITE SUITABLE FOR THE CROP**

1. Identify a site suitable for growing the crop (maize).

**Characteristics of a site suitable for growing the crop**

- Performs well on deep, fertile, well drained and well aerated loamy soils, with a PH of 6 to 7. soil should have a good nutrient content and good water - holding capacity, without caps and pans and free from soil - borne pests and disease

## SUB TOPIC

### CROP ROTATION

1. Explain why it is necessary to rotate a crop

#### Necessity of crop rotation

- Helps to increase crop yields because soil fertility is maintained
- Enable farmers to harvest different crop types from the same piece of land
- Improves soil structure during the fallow period
- Offers proper utilization of soil nutrients
- Controls pests and diseases by breaking the life cycle of pests and disease - causing agents

2. Draw a plan to fit the crop in a suitable rotation.

#### Planning for crop rotation

#### A 4 year crop rotation

Field	Year 1	Year2	Year 3	Year4
1	cotton	bean	maize	fallow
2	maize	fallow	beans	cotton
3	fallow	maize	cotton	beans
4	beans	cotton	fallow	maize

## SUB TOPIC

### 1 LAND PREPARATION

Prepare a piece of land for growing of the crop.

#### Preparation of piece of land for growing the crop.

- Teacher to explain to pupils how land preparation is done

3. Prepare sowing/planting stations for the crop.

#### Sowing/planting stations.

- **planting stations are marked and dug at 90cm by 30cm**

### **SUB TOPIC**

#### **MANURE AND FERTILISER APPLICATION**

1. Calculate the quantity of fertilizer and manure recommended per unit area.  
**Quantities of manure and fertilizer recommended per hectare.**

**Refer to grade 8 work on manure and fertilizers**

2. Apply fertilizer and manures recommended correctly.  
**Fertilizer and manure application.**

**Refer to grade 8 work on fertilizers and manure recommendation**

3. Explain the importance of dressing seeds/planting materials with chemicals before sowing/planting.

**Dressing seeds/planting materials.**

**Refer to grade 8 work**

### **SUB TOPIC**

#### **SOWING AND PLANTING MATERIALS**

1. Select suitable sowing or planting materials.  
**Sowing or planting materials.**

- **Should be free from deformities, diseases, and pest**
  - **Should be healthy plants**
  - **Should be genetically, fully developed and free from contaminations**
  - **Materials should be viable**
  - **Should have potential of high yielding**
  - **Should be diseases -resistant**
  - **Planting sowing material should be uniform in size**
2. Demonstrate correct sowing or planting  
**Planting or sowing**
    - **The depth of planting largely depends on the size of the seed or planting materials. small seeds such as millet can be broadcast and covered with little soil while large seeds like maize are planted in holes of 5cm depth**

### **SUB TOPIC**

#### **PLANT POPULATION**

1. Determine the germination percentage of seeds.

### Germination percentage of seeds.

- Get a sample of seeds from the collection of seeds
- count the number of seeds from the sample and record it e g 50 seeds
- plant the seed in a safe place where they will be monitored
- provide the necessary conditions for germination
- keep monitoring until the seeds germinate
- count the seeds which germinated and record e g 40 seeds germinated
- count the ungerminated seeds and records e g 10 seeds did not germinate
- germination percentage can be calculated

Germinated percentage =  $\frac{\text{The number of germinated seeds}}{\text{The total number of seeds planted}} \times 100$

$$40/50 \times 100 = 80\%$$

2. Calculate the number of plants per given area.

#### Calculating plant population

- Total plant population = total number of row x average number of crop plant per

### SUB TOPIC

### WEED CONTROL

1. Explain the importance of weed control in a field crop.

#### Importance of weed control.

- Eliminates competition of weeds for nutrients
- control crop pests and diseases
- it increases crop yields by eliminating competition of weeds for nutrients
- facilitates harvesting of crops because there will not be weed seeds to mix with crops during harvesting

2. Demonstrate the methods of weed control that are applicable to the crop being studied.

#### Methods:

- Chemical weed control methods – involves the use of herbicides e g paraquat, 2, 4 –D or MCPA

- **And Mechanical - involves the use of machinery such as tractor drawn implements and animal drawn implements such as cultivator and hoes**

## **SUB TOPIC PESTS**

1. Suggests ways of controlling the pests.

### **Ways of controlling pests**

- **Chemical control method**
- **Mechanical method**
- **Biological control meth**

## **SUB TOPIC DISEASES**

1. Identify the symptoms or signs of diseases on field crop.

### **Symptoms of diseases on a crop.**

- **Red or dark brown powdery pustules appear on both sides of leaves**
- **Narrow, yellow, nearly white bands parallel to the midrib appear on the infected leaves**
- **Attacked maize plants produce black bodies enveloped in silvery structures on the cob of maize**
- **Stunted growth most common**
- **Wilting of crop plant**

2. Identify the crop attacked by diseases.

### **Crop attacked by diseases.**

- **maize**

3. Explain methods of preventing and controlling disease attack on the crop.

### **Methods of preventing disease attack on the crop.**

- **Early planting helps to prevent and control maize rust**
- **practicing crop rotation prevents and controls the disease**
- **planting streak – resistant maize varieties controls the disease**
- **Seed dressing with appropriate chemicals controls the disease**
- **Growing smut resistant varieties controls the disease**

## **SUB TOPIC HARVESTING**

1. Interpret the length of time it takes from planting or sowing up to maturity.

**Maturity of crops**

- **Period of maize from planting to harvesting varies from 4 to 8 months depending on the cv grown and the attitude of the place where the maize is grown**

2. Identify the signs of readiness for harvesting the crop

**Signs of readiness for harvesting**

- **Colour of the maize plant change from green to yellow then brown and eventually the drying, facing of the cob downward and the whole plant falling**

3. Harvest the crop correctly

**Harvesting**

- **if maize is to be harvested green, stalks are cut at ground level using slasher and the cobs are removed by hand**
- **Done by a combine harvester if on a large scale**

**SUB TOPIC**

**HARVESTING**

1. Interpret the length of time it takes from planting or sowing up to maturity.

**Maturity of crops**

2. Identify the signs of readiness for harvesting the crop

**Signs of readiness for harvesting**

3. Harvest the crop correctly.

**Harvesting**

3. Suggest ways of improving yield.

**Refer to Grade 8 work**

**SUB TOPIC**

**YIELD**

1. State the recommended yield of the crop per hectare.

**Recommended yield of crop per hectare.**

- **Maize can yield up to 8000 to 9000kg/ha, but normally 3000 to 4500 kg/ha are obtained**
2. Compare the achieved yields with the recommended yields  
**Achieved and recommended yields.**
- **Average 3000 to 4500 kg/ha of maize are achieved where as the recommended yields can reach 8000 to 9000 kg/ha. Achieved yields are lower than the recommended yields because of differences in crop husbandry, ecological conditions and the varieties sown**

## **SUB TOPIC STORAGE**

1. Identify types of storage facilities

### **Types of storage facilities**

- **bags or sacks**
- **baskets**
- **granaries**
- **cribs**
- **poles**
- **racks**
- **stores**
- **bins and silos**

2. State the various methods of storing the crop.

### **Methods of storing the crop.**

- **Large quantities of maize can be stored in silos**
- **can be stored in stores**
- **stored in granaries**
- **stored in cribs**
- **stored in bags / sack placed on wooden /store base**

- 3 Store the crop correctly.

### **Storing the crop.**

- **Should be dried thoroughly before storage to prevent storage pests, mould growth, motting and seed germination in storage**
- **be mixed with appropriate storage chemicals to prevent insect pests and infestation**
- **storage facility should be thoroughly cleaned and any cracks filled and dusted with storage chemicals before storage to ensure safe storage**

**SUB TOPIC  
HANDLING AND MARKETING**

1. Handle and market the crop effectively.  
**Handling and marketing the crop.**

**Refer to grade 8 work**

2. Project how much money can be realized from the sale of the crop.  
**Income from sale of the crop.**

- **Income sales of maize depends on how much maize is produced and the price at which is sold**

**Total product x price = income**

**Suppose a farmer produces 58 x 50 kg bags of maize and each bags is sold at K 74.50, the income will be**

$$58 \times 74.50 = \text{K}4321.00$$

$$\text{Income} = \text{K } 4321.00$$

**FORESTRY**

**SUB TOPIC  
SOIL AND WATER CONSERVATION**

1. Explain the role trees play in soil and water conservation.  
**Roles of trees in soil and water conservation.**

- **Leaves and branches of trees falling on the ground act as mulch to check surface runoff by holding the water and allowing it to infiltrate**
- **Roots bind soil particles together thus keeping the soil in one place and preventing soil erosion by water or wind**
- **Act as wind breakers by absorbing the erosive force of strong blowing wind**

**SUB TOPIC  
IMPORTANCE OF TREES IN SOIL MANAGEMENT**

1. Identify leguminous plants that are used to improve soil fertility.  
**Leguminous trees that improve soil fertility.**

- **Tephrosia vogelli**
- **Sesbania sesban**
- **Griricidia sepium**
- **fedberbia albida**

2. Explain how leguminous trees improve soil fertility

**Improving soil fertility using leguminous plants**

**Tree planting**

- **Symbiotic nitrogen fixation done by the rhizobium spp. bacteria in roots nodules on the roots of leguminous trees. rhizobium bacteria draw atmospheric nitrogen and fix it in the root nodules in form of nitrates that can be absorbed by plant roots**

**CONSERVATION FARMING**

**SUB TOPIC**

**TILLAGE**

1. Describe Conservation tillage.

**Tillage –**

- **is the cultivation of soil using either hand tools or machines like ploughs to prepare land for growing crops**
- **there two types of tillage primary and secondary**

**Conservation tillage –**

- **Is when land is done without cultivating the land at all but only herbicides are applied to prepare land for plating crops. It is also called NO TILLAGE**
- **reduces chances of soil erosion**
- **herbicides are sprayed on the herbaceous plants covering the soil**

**SUB TOPIC**

**LAND CLEARING**

1. Find out the importance of leaving the residues on the surface at the end of the dry season

**Importance of leaving residues:**

- Refer to retention of nutrients, reduce weed growth, encourages soil microbial activities and moisture

## **SUB TOPIC**

### **SEEDBED PREPARATION**

1. Explain the preparation of a seedbed using a suitable plough for conservation farming.

#### **Preparing a seed bed using a suitable plough**

- Mould board plough which is either animal- drawn or tractor – drawn is used to prepare a seed bed for planting crops
- Animal – drawn mould board plough is used in areas which are relatively flat with light vegetation cover and light soils
- Tractor – draw mould board is used to prepare land where deep cultivation is not necessary

2. Explain the problems caused by ploughing when preparing seedbeds.

#### **Problems caused by ploughing**

- Ploughing can destroys soil structure
- Heavy machinery churn the wet soil
- Deep ploughing encourages leaching of soluble nutrients
- Is expensive in terms of buying and maintaining machinery used

## **SUB TOPIC**

### **SOWING AND PLANTING**

1. Plant or Sow correctly under conservation farming.

#### **Planting/Sowing**

- should be planted in rows spaced correctly according to the variety or type of crop grown so that the crop rows help to control soil erosion

## **SUB TOPIC**

### **MANURE AND CHEMICAL**

1. Apply manure/chemical fertilizer correctly under conservation farming.

#### **Applying manure/chemical fertilizer**

- Manure should be applied to the soil when completely decomposed, manure is broadcast ahead of planting and is then dug into the soil during tillage operation
- chemical fertilizer should be applied at the correct rates and at the right time using the correct methods of application

- 2 Explain the effects of monocropping and the use of acidified fertilizers on soil and crop yields

## **Effects of monocropping and the use of acidified fertilizers.**

- **If mono cropping is practiced in the same field over a long time, there is build up of pests and diseases of those crops grown from season to season.**
- **The use of acidified fertilizers increases soil acidity and causes the soil pH to be below 5.5**

## **SUB TOPIC**

### **WEEDING**

1. State the importance of early and repeated weeding.

#### **Early and repeated weeding**

- **Early weeding it eliminates competition of plants with weeds for nutrients, moisture, light, space and air.**
- **Repeated weeding removes hiding and breeding sites for crop pests and diseases agents.**
- **Helps to maintain the quality of harvested crop.**
- **Reduces on the population of weeds in the next cropping seasons.**
- **Improves soil aeration.**

## **SUB TOPIC**

### **PEST CONTROL**

- 1 Explain the importance of using organic materials/organisms to Control pests.

#### **Importance of using organic materials or organisms to control pests**

- **using organic materials or organisms to control crop pests is cheap to use because the materials may be locally available at no cost**
- **control crop pests does not impose pollution to the environment**
- **it does not require technical skill to use organic materials or organisms**
- **control of crop pests have no danger of poisoning plant or animals when they are used**

- 2 Demonstrate the preparation or organic pesticides from local materials.

#### **Preparing organic pesticide.**

- Need seed kernel or leaves are pounded and mixed with water to make a pesticides solution. 30gm of neem seed kernels are pounded into powder and mixed with one litre of water.
- Dry chili peppers are pounded and mixed with long-stored animal urine to make the pesticide

3 Control pests using organic material /organisms.

**Controlling pests using organic material/organisms**

- Neem seed kernel or leaf solution as a pesticide is sprayed on crops attacked by thrips, caterpillars and white flies
- A solution of chilli peppers and urine is sprinkled around banana stools to control banana weevils.
- Ashes of cow dung are mixed with dry bean seeds to control bean weevils during storage time.

**SUB TOPIC**

**CROP ROTATION IN CONSERVATION FARMING**

1 Plan a four year crop rotation.

**Four year crop rotation.**

PLOT	YEAR 1	YEAR 2	YEAR 3	YEAR 4
1	Maize	Groundnuts	Sweet potatoes	Rest
2	Groundnuts	Maize	Rest	Sweet potatoes
3	Sweet potatoes	Groundnuts	Maize	Rest

2 Explain the importance of crop rotation in pest control.

**Crop rotation and pest control.**

- Crop rotation controls pests by breaking their cycles when different crops follow one another in the rotation because pests are associated with particular crop types or families.

3 Explain the importance of crop rotation on soil fertility.

**Crop rotation and soil fertility**

- Crop rotation -Controls soil erosion by growing different types of crops in succession. The soil is protected more thoroughly during the fallow period when the land is allowed to rest under the vegetation cover
- Soil fertility. Legume crops grown in the rotation fix nitrogen in their root nodules. the nitrates fixed in root nodule enrich the soil with nitrogen thus increasing soil fertility

## SUB TOPIC

### MANURE

- 1 State the importance of manure in conservation farming.

#### **Importance of manure in conservation farming**

- **it improves soil structure**
- **it improves soil porosity**
- **it increases soil microbial population**
- **it conserves soil nutrients and retains soil moisture for plant use**
- **provides soil humus which stabilizes the soil PH by maintaining the acid – base condition of soil**

- 2 Identify sources of organic manure

#### **Sources of organic manure**

- **farmyard manure**
- **compost manure**
- **green manure**

- 3 State the nutrient status of some manure.

#### **Nutrient status of some manure**

- **cattle manure contains nitrogen, phosphorus, potassium and minor elements**
- **pig manure is relatively low in nitrogen and potassium**
- **poultry manure has very high concentration of nitrogen and phosphorus plus other nutrients**
- **compost manure contains nitrogen, phosphorus and potassium but lesser percentage than those contained in farmyard manure**

- 4 Apply manure correctly

#### **Applying manure**

- **Should be applied to the soil when it is completely decomposed so that it can release nutrients to the soil.**
- **Avoid applying fresh manure to fields for it may not only burn the crops but also attract insect**
- **it is broadcast over the soil and dug into the soil to avoid evaporation of nutrients like nitrogen manure**

## LIVESTOCK PRODUCTION

## SUB TOPIC

### IMPORTANCE OF LIVESTOCK

1 State the nutritive value of livestock studied.

#### Nutritive value of Livestock

- provides milk
- meat

2. Analyse the economic importance of livestock studied.

#### Economic importance of livestock

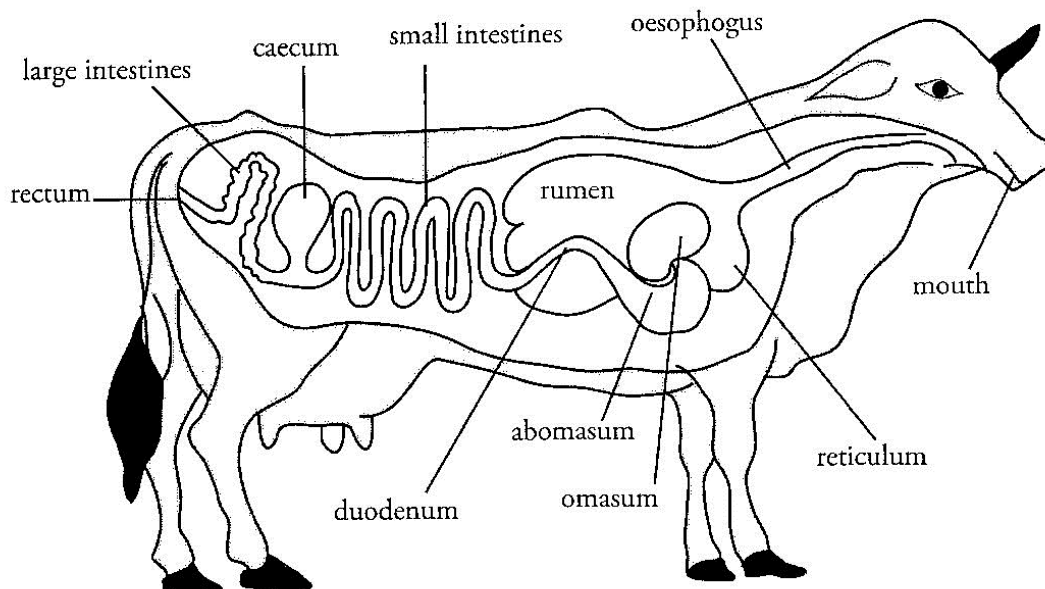
- Cattle are good foreign exchange earner
- Cattle ownership is a way of accumulating wealth
- Cattle may act as means of payment
- Cattle keeping is way of diversifying agriculture in the country
- Provide raw materials to industries
- Source of organic manure.

## SUB TOPIC

### DIGESTIVE SYSTEM IN LIVESTOCK

1 Identify and label a diagram of the digestive system of a ruminant

#### Parts of the digestive system of a ruminant



2 Explain the difference between Ruminant and non-ruminant.

**Ruminants and non-ruminants**

<b>RUMINANTS e g cows, goat</b>	<b>NON- RUMINAANTS e g pig, chicken</b>
<ul style="list-style-type: none"><li>• <b>Chew the cud</b></li><li>• <b>digest cellulose</b></li><li>• <b>have small caecum</b></li><li>• <b>have 4 stomach compartments</b></li><li>• <b>regurgitate food after swallowing</b></li><li>• <b>water absorption occurs in the omasum and colon</b></li></ul>	<ul style="list-style-type: none"><li>• <b>Do not chew the cud</b></li><li>• <b>they do not digest cellulose</b></li><li>• <b>have large caecum containing bacteria that assists in digestion</b></li><li>• <b>cannot regurgitate food after swallowing</b></li><li>• <b>water absorption occurs in the colon</b></li></ul>

**SUB TOPIC  
RATIONS**

1 Distinguish between maintenance and production rations.

**Maintenance -**

- **Is the quantity of food required by an animal to keep alive and healthy**

**And production rations –**

- **Is the amount of feed required by animal above the maintenance requirement**

2 Make a reasonably well balanced economic diet for at least one type of livestock from local Food sources.

**Making a balanced ration from local resources**

- **A famer can mix the following ingredients to make a ration for cattle from local resources**
- **Cereals i.e. maize or sorghum as energy source are mixed with legumes e g groundnuts, soya beans as protein sources which are supplemented example 80kg of maize are mixed with 20kg of groundnuts seed plus a mineral lick.**

3. Compare the growth rates of animals fed on alternative diets and relate these to ration quality.  
**Growth rate of animals fed on alternative diets and recommend feed**

Comparison is that animals feed with recommended feed did better in terms of body condition ( weight) because the feed contain all the necessary nutrients while those feed alternative feed did perform well

**SUB TOPIC  
 CONVERSION RATIO**

1. Calculate food conversion ratio from the records of farm animals.  
**Food conversion ratio.**  
 Use formula

• **Food conversion ratio =  $\frac{\text{weight of food consumed}}{\text{Livestock weight gain produced}}$**

E g a rabbit weighing 1kg consumed 100 gm of rabbit concentrates (pellets) per day for 8 weeks and was found to weight 3kg. Calculate the conversion ratio.

Food conversion = weight of food consumed in weeks divided by the live weight gain produced.

Weight of food consumed in the period = 100gm x 7x8  
 = 5600gm = 5.6kg

Live weight gain produced = 3kg -1kg

= 2 kg

Therefore conversion ratio =  $\frac{5.6\text{kg}}{2\text{kg}} = 2.8$

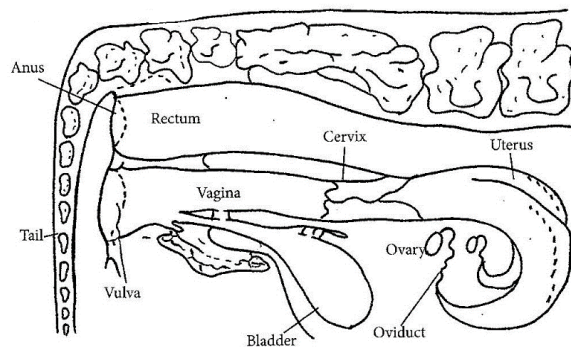
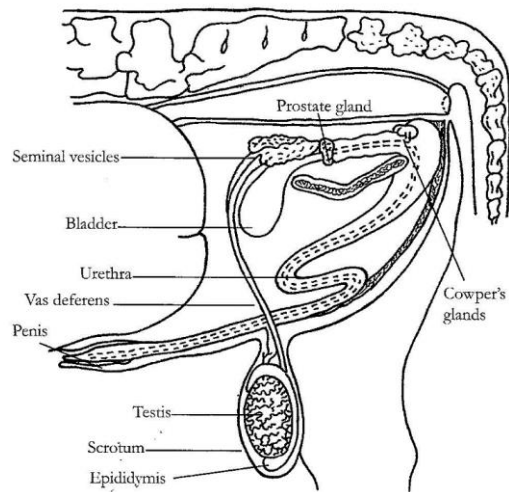
2kg 1

=2.8:1

## SUB TOPIC REPRODUCTIVE SYSTEMS

Describe the reproductive systems of male and female animals studied.

### Reproductive systems of male and female animals.



## SUB TOPIC FERTILITY AND CHARACTERISTICS OF COMMON BREEDS

1. List the factors that affect the fertility of male and female animals studied.

### Factors that affect fertility:

- **Nutrition, health, hereditary, cryptorchidism and anorchidism**

2. Identify an animal on heat period.

### Signs of an animal on heat

- **Loses appetite**
- **Becomes restless**
- **Frequent urination**
- **it separates from the others**
- **Rises of body temperature**

3. Identify the best time for breeding animals.

#### **Time for breeding**

- **Best time to breed is when the female is on heat. Thus this is the time when the ovary releases the ovum (ovulation). proper time to breed is 8 to 15 hours after the cow shows sexual desire to be mated**

-4Recall the gestation period of animals studied.

#### **Gestation period of animals**

- **Cow is 280 days**
- **Doe is 31 days**

4. Given the date of mating, predict the date of parturition.

#### **Predicting date of parturition (birth)**

- **if a cow is mated on a certain date say 1<sup>st</sup> march 2015, count an average of 280days of gestation to arrive at the expected parturition date, which should be 5<sup>th</sup>December**

6. Describe the characteristics of common breeds of animals studied.

#### **Characteristics of breeds studied.**

##### **Jersey –**

- **coat colour is red and light brown**
- **butter fat content is 5% and above**
- **mature cow weights 450 kg**

##### **Friesian –**

- **white and black patches**
- **has a large, well developed udder**
- **butter fat content is 3.5%**
- **mature cow weights about 500 to 700kg**

- **has high high milk yield**

**Brahman –**

- **they grow very fast**
- **they live longer**
- **they are heat tolerant**
- **have large dew laps**

## **SUB TOPIC LIVESTOCK IMPROVEMENT**

1 Describe steps involved in a programme of livestock improvement.  
**Livestock improvement**

- **individual (mass) performance**
- **pedigree selection**
- **family selection**
- **off spring testing**

## **SUB TOPIC MANAGEMENT PRACTICES ON YOUNG ANIMALS**

1. Carryout management practices required on young animals.  
**Managing young animals**

**Attention should be given in the following aspects such as –**

- **feeding**
- **housing**
- **medication**
- **pest and diseases control**
- **vaccination**

## **SUB TOPIC PASTURES**

1 Compare the characteristics of natural pastures and improved pastures.  
**Natural –**

- **have the ability to persist under natural conditions**
- **tend to mature very fast and become steamy**
- **consist of wide spectrum of plant species growing naturally in particular areas**

- cheap to maintain
- usually grazed communally

**And improved pastures –**

- consist of selected and established pasture species
- selected are suitable to local ecological conditions of area
- consist of improved grasses and legumes
- used for farming like dairying
- more palatable to livestock than natural pasture

2. Explain the maintenance of a productive pasture.

**Maintaining productive pasture**

- Periodic weeding should be carried out
- should be fenced to avoid animals from outside
- apply fertilizers
- good and correct grazing management system
- ensure irrigation is done
- include lots of legumes to improve pasture

3. Maintain a small productive pasture.

**Small productive pasture**

- pasture should be divided into fenced paddocks
- pasture land should be fenced
- correct stocking rate
- regular removal of weeds
- fertilizer be applied

## **SUB TOPIC**

### **PARASITES AND DISEASES**

1. Identify various parasites of farm animals.

**Parasites of animals**

- ticks
- lice
- mites
- tsetse flies
- tapeworms

- **roundworms**
- **liver flukes**

2. Suggest various methods of prevention or controlling parasites on farm animals.

**Methods of prevention or controlling parasites**

**External parasites –**

- **regular dipping or spraying and dusting**
- **rotational grazing**
- **fencing**

**Internal parasites –**

- **regular sanitation**
- **drawing waterlogged places in pastures**
- **controlled burning**
- **practice zero- grazing**
- **bush clearing and spraying with appropriate chemicals**

2. Describe the common diseases of farm animals.

**Common diseases of farm animals**

**Anthrax –**

- **caused by bacteria**
- **highly infection and transmitted**
- **infected animals usually die before or soon after showing signs of the disease**
- **on death blood oozes from the nose, nose, mouth and anus of the infected animal**

**Mastitis–**

- **attacks the udder and teats causing them to swell and develop sores on them**
- **it attack cows, goat, ewes and sows**

**Other diseases includes -**

- **East coast fever**
- **Newcastle disease**
- **Foot and mouth disease**
- **Tuberculosis**

3. Suggest various methods of prevention and or controlling diseases.

## **Methods of preventing and or controlling diseases**

- **rotational grazing helps to break cycles of disease agents**
- **regular vaccination of animals**
- **avoiding overcrowding of animals**
- **fencing the farm**
- **provision of clean water feeds**
- **regular dipping or spraying to control disease vectors like ticks**

## **SUB TOPIC MARKETING**

1 Prepare animals for marketing.

### **Preparing animals for marketing**

- **animals to be marketed should be properly fed so that they are fleshy at time of marketing**
- **should be cleared of any dirt band groomed to remove any loose hair**
- **well handled so that they do not sustain any injuries before marketing**

2 Prepare animals products for marketing.

### **Preparing animal products for marketing**

- **liquid animal products like milk should be filtered to remove any remove any foreign bodies**
- **should be put in clean, sterilized receptacles to avoid spoilage by bacteria**
- **milk should be put under cool conditions like refrigerators**
- **require processing before marketing e g yoghurt**
- **packed and labeled for marketing**

3. Market animals and animal products.

### **Marketing animals and animal products**

- **Animal products to be marketed require means of transport from the point of production to the marketing institutions and final consumers**
- **Animal products should be graded**
- **Animal and animal products for marketing can be advertised through radio and TV**

**FARM STRUCTURES**  
**SUB TOPIC**

**STORAGE FOR GRAINS**

1. Prepare grains for storage.

**Preparing grains for storage**

- **Refer to grade 8 work on storage of grain**

2. Describe an appropriate storage facility for grains.

**Storage facility for grains**

- **baskets**
- **bags /sacks**
- **silos**
- **bins**
- **stores**
- **cribs**
- **granaries**

3. Identify an appropriate storage facility for grains

**Appropriate storage facility for grains.**

- **storage should be clean enough**
- **be vermin- proof to avoid rodents**
- **be cool enough not to cause over –ripening**
- **should be well – ventilated**
- **should be storage enough to protect the grains from any physical damage**

**SUB TOPIC**

**STORAGE FOR FRUITS**

- .1 Prepare grains for storage

**Preparing grains for storage**

- **harvested grain like maize should be dried thoroughly to moisture content of about 13% or below for safe storage**

2. Describe an appropriate storage facility for grains.

**Storage facility for grains**

- be leak proof
- be vermin – proof
- should be damp –proof
- should not have any cracks
- well ventilated
- smooth walls
- large enough to store
- should have lockable door

3. Identify an appropriate storage facility for grains.

**Appropriate storage facility for grains**

**One which should have the following –**

- i) leak proof
- ii) vermin –proof
- iii) damp proof should have no cracks

**SUB TOPIC**

**STORAGE FOR FRUITS**

1 Prepare fruits for storage.

**Preparing fruits for storage**

- should be harvested and handled carefully to avoid damaging or bruising them which encourages rotting of the fruits during storage
- be cleaned of any dirt
- stored so that any ripe fruits are put aside
- graded according to their size, colour and freshness

2 Describe an appropriate facility for storing fruits.

**Appropriate facility for storing fruits**

- fruits should be stored in bins which is tightly closed
- cold storage refrigeration can be used
- wooden boxes provided for storage
- cool rooms and dry places with air circulation

4. Identify an appropriate Store for fruits.

**Facility for storing fruits**

- fruits should be stored in bins which is tightly closed

- cool rooms and dry provided with good ventilation
- in cold storage refrigerated can be used to store fruits

## SUB TOPIC RABBIT HOUSES

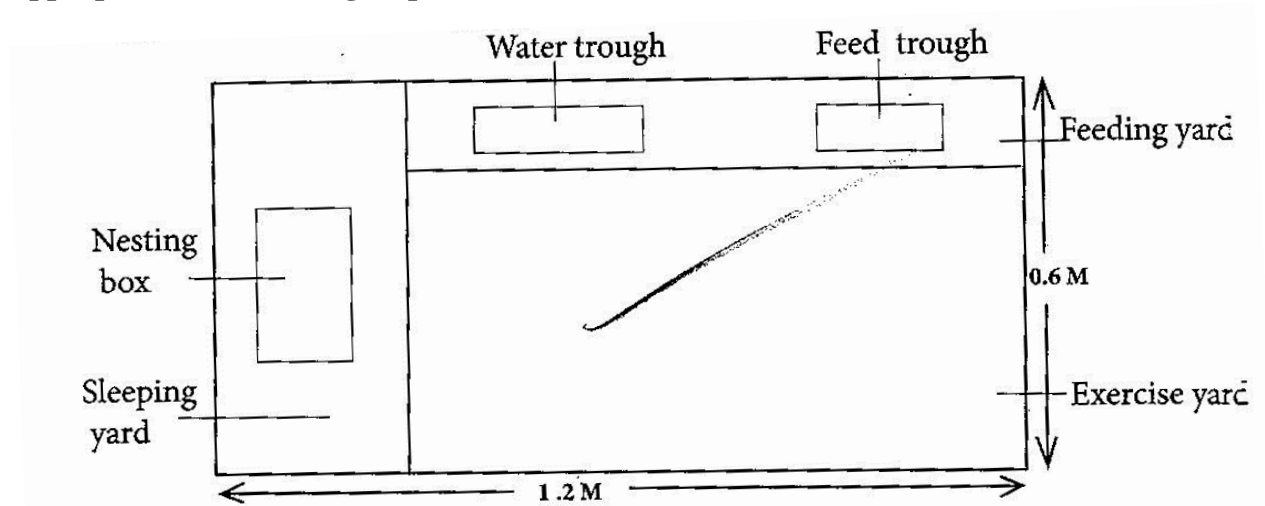
- 1 List types of houses for rabbits.

### Types of house for rabbits

- individual hutches
- colony hutches
- morant hutches

2. Plan an appropriate house for a given group of rabbits.

### Appropriate house for a group of rabbits



## SUB TOPIC PIGSTIES

1. List the various types of shelter for pigs.

### Types of houses for pigs

- boar pen
- farrowing unit
- breeding and gestation
- growing -finishing unit

2. Describe an appropriate shelter for a given group of pigs.

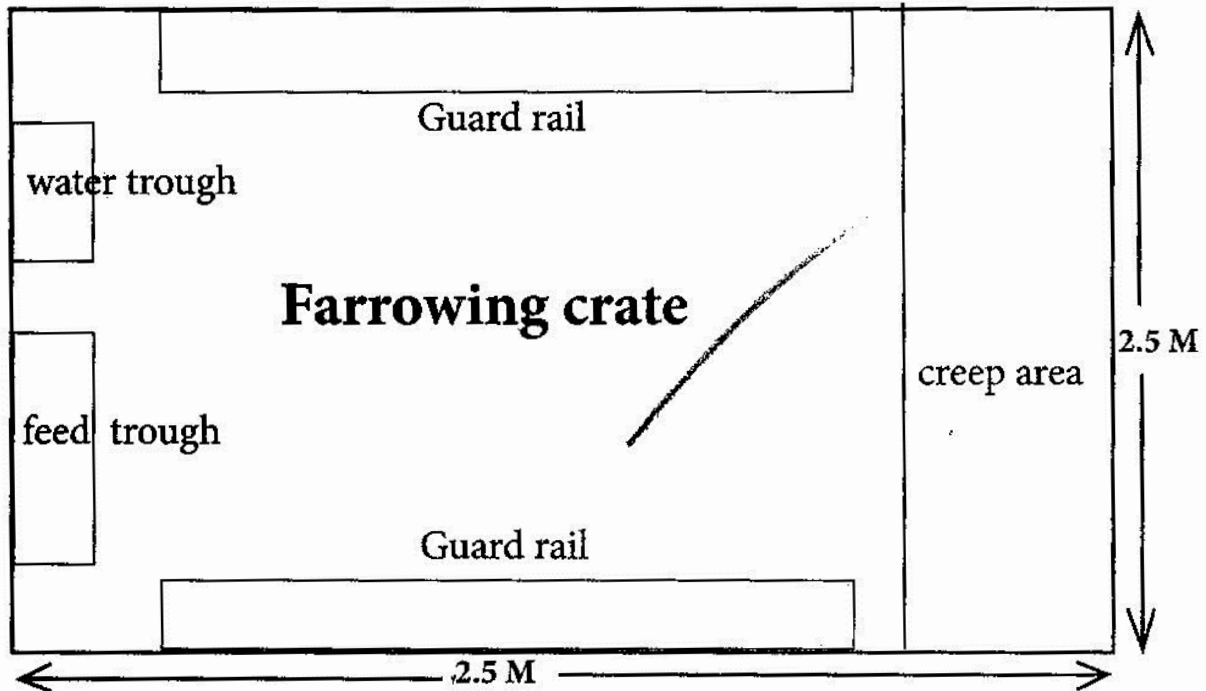
### Appropriate house for a group of pigs

- should be sited on a well – drained place

- be properly heightened and ventilated
- it should be warm and dry
- have a strong lockable door
- should protect the pig from extremes of weather, predators and thieves

3. Plan an appropriate shelter for a given group of pigs

**Planning house for a group of pigs**



**SUB TOPIC  
GOAT HOUSES**

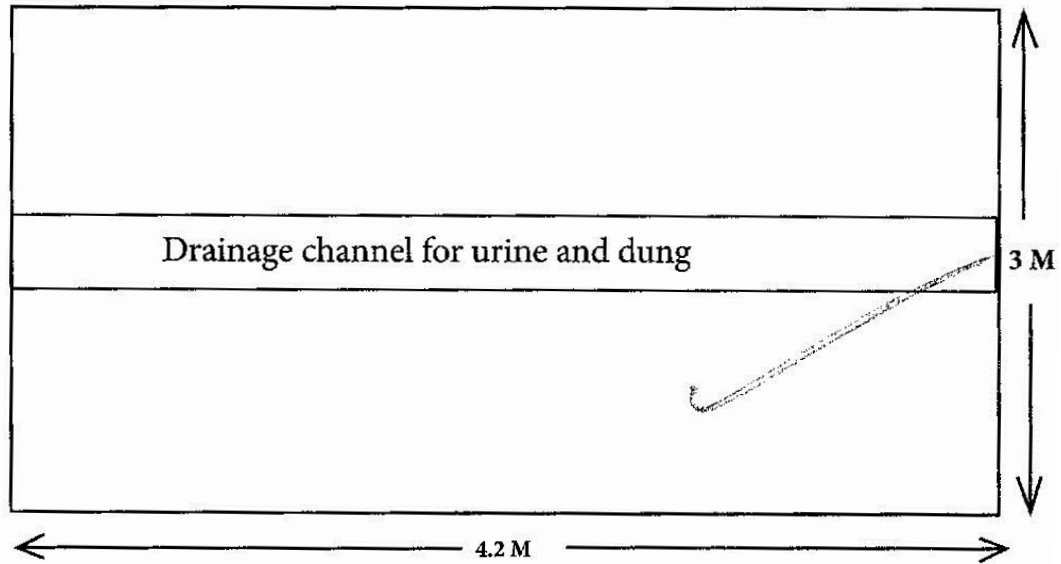
1. List types of goat shelters.

**Types of goat shelter**

- ordinary goat house
- raised goat house with a slatted floor

2. Prepare an appropriate shelter for a given class of goats.

**Preparing a shelter for goats**



**SUB TOPIC  
CATTLE HOUSES**

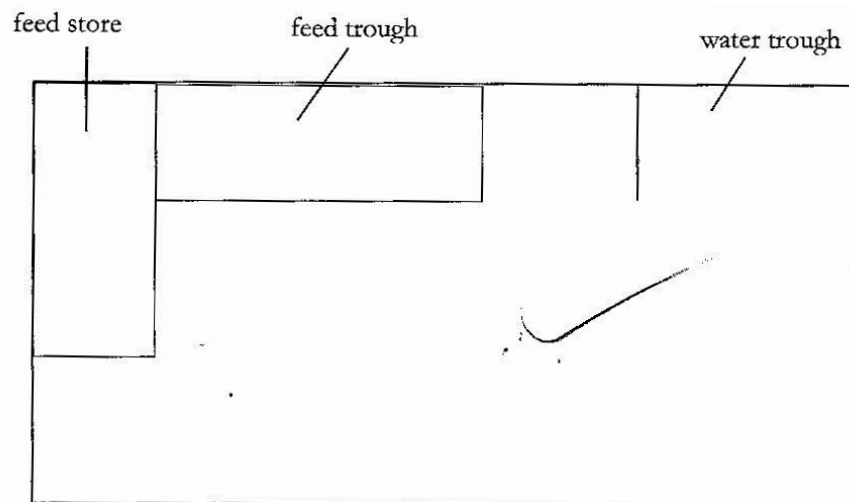
1. List appropriate types of shelters for cattle.

**Types of shelter for cattle**

- milking parlours
- calf pens
- kraal

2. Prepare an appropriate shelter for a given class of cattle

**Preparing a shelter for a given class of cattle**



**SUB TOPIC  
DRAINAGE PEN**

1. State the dimensions of the collecting pen and the drainage pen.  
**Collecting pen - 2m<sup>2</sup>**

**And drainage pens – 27m long or more**

2. Describe a dip tank

**Dip tank –**

**Is a farm structure used for dipping animals it consist of the following, roof, concrete floor, footbath, dip wish, entrance race, post and rails, exit and the drainage pen**

**SUB TOPIC  
CONCRETE MIXTURES**

1. State the proportions of concrete mixtures suitable for various building purposes.  
**Concrete mixtures**

<b>cement</b>	<b>sand</b>	<b>Aggregates</b>	<b>Building purpose</b>
<b>1</b>	<b>1</b>	<b>2</b>	<b>Fence posts</b>
<b>1</b>	<b>1.5</b>	<b>3</b>	<b>Walls, beam</b>
<b>1</b>	<b>2</b>	<b>3</b>	<b>Feed troughs, milking parlour</b>
<b>1</b>	<b>2</b>	<b>4</b>	<b>Floor foundation</b>
<b>1</b>	<b>3</b>	<b>3</b>	<b>Floor in dairy</b>
<b>1</b>	<b>3</b>	<b>4</b>	<b>Piggery, water tank, stores</b>
<b>1</b>	<b>3</b>	<b>4</b>	<b>Concrete block</b>

2. Demonstrate mixing concrete for various building purposes.

**Mixing concrete**

- **Choose a level ground and remove all the rubbish**
- **Have cement, sand, sand and aggregates in right proportion according to the building purpose**
- **Spread quantity of sand on the cleared level ground**
- **Spread the quantity of cement over sand**
- **Mix aggregates with sand and cement until they are thoroughly and uniformly mixed**
- **Then make a depression in the centre of mixture and add water slowly while mixture is being turned till it looks uniform**

3. Name the various types of bricks and blocks.

### **Types of bricks and blocks**

- **mud bricks**
- **concrete blocks**
- **sand block**
- **soil cement blocks**
- **Kimberly blocks**

#### 4. **Make bricks and blocks.**

##### **Making bricks and blocks**

- **made bricks are removed from the moulds**
- **left to dry on a hard and level ground**
- **are inspected and turn regularly for drying**
- **after drying bricks are taken to the kiln for firing**
- **are fired until they are red -hot**
- **left to cool down after which they are used**

## **FARM MACHINERY**

### **SUB TOPIC**

#### **POWER DRAWN IMPLEMENTS FOR SOIL PREPARATIONS**

##### 1. **Identify tractor drawn implements for preparing soil**

###### **Tractor drawn implements for preparing soil**

- **Disc plough**
- **Cultivator**
- **Mouldboard plough**
- **Subsoiler**
- **Ridger**

### **SUB TOPIC**

#### **POWER DRAWN IMPLEMENTS FOR SOWING/PLANTING**

##### 1. **Identify tractor drawn implements for planting**

###### **Tractor drawn implements for planting**

- **planter**

##### 2. **Describe the proper care of tractor drawn implements**

###### **Care for tractor drawn implement**

- **cleaning**
- **oiling**
- **Painting and storage.**

## **SUB TOPIC STORAGE FOR FARM MACHINERY**

1 Prepare power drawn implements for storage.

### **Preparing power drawn implements for storage**

- **All implements should be cleaned or washed after use**
- **carry out timely repair of all damage parts**
- **smear with oil or grease all implements**
- **check for broken parts**
- **check for any loose nuts and bolts**

2. Describe an appropriate facility for storing power implements.

Appropriate facility for storing power implements

- **Implements used in farming can normally be stored in any multipurpose store , the store needs only to be secure for protection of equipment from theft and vandalism and dry so as to avoid deterioration of the metal, plastic and wooden parts**

## **FARM MANAGEMENT**

### **SUB TOPIC**

#### **THE FARM**

1 Identify the resources the farm requires for production.

- **Capital**
- **labour**
- **land**

2. Explain the idea of the farm as a business.

**A farm as a business unit- must be managed very well. Farm management is the art and science of organizing and operating a farm business efficiently. This has three important things –**

- output must be maximized from input**
- decision on output from input must be accurate to ensure maximization**
- Enterprise as a farm must control the efficient use of the factor of production for maximization of output.**

### **SUB TOPIC**

#### **ENTREPRENEURSHIP**

1 Describe an enterprise.

- **Enterprise–is a project or a business undertaking**

2 Describe entrepreneurship. -

- **Entrepreneurship- is a person who combines the other factors of production – land, labour and capital – to earn a profit**

3 Explain how to find a Market for the farm products

**Finding a market–**

- **Bearing risk of handling produce**
- **buying and assembling produce**
- **selling produce through presentation and advertising**
- **financing the distribution of the products to the consumers**