**AGRICULTURAL SCIENCE JSS 2**

**FIRST TERM**

## SCHEME OF WORK

**WEEK TOPIC**

1. Revision of J SS1 Work
2. Farm Structures and Building
3. Siting of Farm and layout of farm structures
4. Cultural Practices: Preplanting operations
5. Cultural practices: Planting Operations
6. Cultural Practices: Post planting Operations
7. Farming System
8. Cropping Systems
9. Field Work
10. Revision
11. Examination

**REFERENCE BOOKS**

* Presscribed Agricultural Scinece for Junior Secondary Schools Book 2 by S.A Omoruyi
* Junior Secondary Agricultural for Nigerian Schools Book 2 by Anthony Yandeowei, B.K. Kaigama, S.O Adesiyan, J.N Ogbazi, Terry Olowu.

**WEEK ONE**

**TOPIC: REVISION AND GENERAL CLEANING.**

CONTENT

- Definition of a crop

- Classification of crops

DEFINITION

A crop is a plant cultivated by humans for eventual harvest. Crops can be categorized as follows:

1. According to their utility

2. Based on their life cycle

3. According to the number of cotyledons

CLASSIFICATION OF CROPS ACCORDING TO THEIR USES

Crops in this category are grouped according to the primary food substances they provide. These classifications include:

(i) Legumes

(ii) Cereals

(iii) Roots and tubers

(iv) Vegetables

(v) Fruits

(vi) Beverages

(vii) Oilseeds

(viii) Latex-producing plants

(ix) Fiber crops

(x) Spices

(xi) Medicinal plants

(xii) Forage crops

(xiii) Nuts

EVALUATION

1. What is the definition of a crop?

2. List ten classifications of crops based on their uses.

CLASSIFICATION OF CROPS ACCORDING TO THEIR LIFE CYCLE

Crops can be grouped into three categories based on their life cycle:

(A) Annual Crops: These crops complete their life cycle within a single year or planting season. Examples include Maize, Rice, Millet, Yam, Tomato, and Guinea Corn.

(B) Biennial Crops: Biennial crops require two years to complete their life cycle. They spend the first year growing and storing food, with reproduction and maturity occurring in the second year. Examples include pineapple, cocoyam, plantain, banana, and sugar beet.

(C) Perennial Crops: These crops have a life cycle that extends beyond two years, primarily represented by tree crops such as Rubber, Cocoa, Oil Palm, and Orange.

ACCORDING TO THE NUMBER OF COTYLEDONS

Crops can also be classified based on the number of seed leaves or cotyledons they possess. These categories are:

(A) Monocotyledonous crops

(B) Dicotyledonous crops

(a) Monocot crops: These crops have only one seed leaf or cotyledon. Examples include millet, rice, maize, and oil palm.

(b) Dicot crops: These crops have two seed leaves or cotyledons. Examples include cowpea, melon, mango, pumpkin, and soya beans.

EVALUATION

1. Define a crop.

2. Classify crops based on their life cycle and provide examples.

3. State three examples each of monocots and dicots.

SUB-TOPIC: WEED

- Definition of Weed and Pest

- Types and Classification of pests

- Physical control, Chemical control, and Biological control

WEED

A weed is any plant that grows where it is unwanted and is not intentionally cultivated. Examples include commelina, goat weed, or the common water leaf (Talinum triangulare) growing in a cassava field.

TYPES OF WEEDS

A. Annual weed: These weeds grow and complete their life cycle in one year.

B. Perennial Weeds: These weeds persist for more than one year.

PEST

A pest is any living organism, whether plant or animal, that can cause damage to cultivated crops, farm animals, or humans.

CLASSIFICATION OF PESTS

Pests can be classified into two main categories:

i) Insect Pests: Insect pests are invertebrates belonging to the arthropod group, which includes insects, crabs, shrimps, millipedes, spiders, centipedes, and scorpions.

ii) Non-insect Pests: These are animals like nematodes, mites, snails, slugs, etc., and vertebrates like rats, squirrels, monkeys, glasscutters, birds, and jackals that can cause damage to crops.

EVALUATION

1. What is a pest?

2. Mention two classes of pests.

3. Define weeds.

4. List five examples of weeds and describe three features of weeds.

CLASSIFICATION OF INSECT PESTS

Insect pests can be classified based on their mouthparts into three groups:

1. Biting and Chewing Pests

2. Piercing and Sucking Pests

3. Boring Insects

NATURE OF DAMAGE

Pests can cause various types of damage, including:

1. Destruction of crop tissues

2. Stunted growth

3. Weakened crop plants

4. Infestation of pierced holes with harmful organisms like fungi, bacteria, and viruses

5. Transfer of harmful organisms from infected crops to healthy ones

6. Adverse effects on human and livestock health

CONTROL MEASURES

(a) Physical Control

(b) Chemical Control

(c) Biological Control

SUB-TOPIC: Factors of Production

1. Land: Refers to the area where productive activities such as crop cultivation, animal rearing, and farm infrastructure are established.

2. Labour: Encompasses all forms of productive human effort utilized in production, including both physical and mental exertions.

3. Capital: Comprises all human-made productive assets employed in the production process.

4. Farm Management: Refers to individuals or groups responsible for coordinating, organizing, and overseeing the utilization of other factors of production to produce goods and services.

Functions of Farm Manager

The functions of a farm manager can be categorized into five major areas:

(a) Organization

(b) Administration

(c) Production

(d) Marketing

(e) Evaluation

GENERAL EVALUATION

1. What is agriculture?

2. Name five examples of monocot plants.

3. List five examples of dicot plants.

4. Mention ten classifications of crops based on their uses.

5. a. Define a weed. b. What is a pest?

6. Describe four methods of controlling weeds.

7. Name two types of insect pests and provide two examples of each.

8. List five potential damages caused by pests to crops.

READING ASSIGNMENT

Refer to "Junior Secondary Agriculture for Nigerian Schools Bk 1" by A. Youdeowei, B.K. Kaigama, J.N. Ogbazi, S.O. Adesiyan. Chapter 3, Page 23, Pages 76-81.

WEEKEND ASSIGNMENT

1. Dicotyledonous plants have \_\_\_\_\_\_\_\_a. four cotyledons b. three cotyledons c. two cotyledons d. one cotyledon

2. When the number of pests is high, which control method becomes challenging? a. chemical control b, physical control c. biological control d. cultural control?

3. \_\_\_\_\_\_\_ involves the use of natural enemies of insect pests and weeds against them. a. physical control b. chemical control c. cultural control d. biological control

4. Which of the following crops does not store food in their roots? a. Cassava b. potato c. Carrot d. sugarcane

5. Procurement of a loan or capital for farming activities falls under which function of a farm manager? A. administration B. production C. organization D. marketing

THEORY

1. Classify crops according to: (a) economic uses (b) the life cycle (c) the number of cotyledons.

2. Define the terms annuals, biennials, and perennials.

3. What is management?

4. List and briefly explain five major functions of a farm manager.

**WEEK TWO**

TOPIC: FARM STRUCTURES AND BUILDINGS

CONTENT

- Definition of farm structures

- Types of farm structures

- Types of farm buildings

FARM STRUCTURES

Farm structures can be defined as any construction on a farm site designed to facilitate various farming operations. These structures are essential for improving the efficiency of farming activities. The choice of farm structures on a particular farm depends on the type of farming operation, the scale of operations, site conditions, and available financial resources.

TYPES OF FARM STRUCTURES AND THEIR USES

Various structures may be present on a farm, including:

1. Silos: Silos are tall, cylindrical, or rectangular structures constructed from materials like concrete, mud, or stainless steel. They are primarily designed for the storage of grains and silage. Modern silos are equipped with humidity control systems, ensuring the long-term preservation of grains. However, they can be costly to build and maintain.

2. Cribs: Cribs are simple grain storage structures typically made of wood with wire gauze on the sides and floors, covered by a thatched or zinc roof. Cribs are used for drying maize while still on the cob. They are elevated above the ground on wooden legs with rodent guards to prevent rats from accessing the grains.

3. Rhumbus: These round structures, made from mud with grass or thatched roofs, are commonly used for storing grains like maize, sorghum, millet, cowpeas, and groundnuts. They are prevalent in drier regions, especially in northern Nigeria, such as Sokoto and Kano States.

4. Feed Mill: A feed mill is a dedicated structure for the production of animal feed. It is cost-effective for large-scale animal farming operations to have their feed mills for feed production.

5. Barns: Barns are temporary structures constructed on the farm to store yam, cassava, grass, or hay. They can be built inexpensively using materials like sticks, mud, and thatch.

6. Abattoirs: These specialized structures are designed for the slaughter and butchering of animals such as goats, sheep, pigs, and cattle. Abattoirs consist of a passageway for animals to reach the slaughter slab where they are held down and processed.

7. Animal Dips and Sprays: Dips are concrete baths or plastic vessels set on the ground, filled with water and disinfectants. They are used to destroy ectoparasites as animals pass through. Sprays are overhead tanks containing disinfectants that drip onto animals, serving the same purpose as dips.

8. Weighbridge: Constructed for determining the weight of farm animals.

9. Crushes: Crushes are narrow passageways, often made of wood or metal, used on animal farms to restrain animals for veterinary check-ups or vaccinations.

10. Water Supply Structures:

a. Dams: Concrete or wooden barriers built across rivers or streams to reduce water flow, accumulating water for irrigation or domestic use.

b. Water Tanks: Containers made of galvanized metal, plastic, or reinforced concrete, elevated on pillars, used for storing water for domestic use and animal watering.

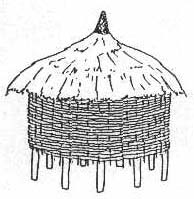
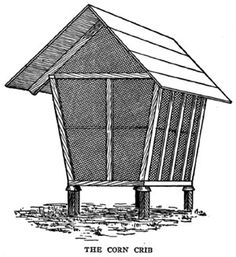
c. Canals: Channels used to transport water from rivers to fields for crop irrigation, or drainage canals designed to remove excess water from the farm.

11. Compost Manure Pits: Pits dug for collecting plant and animal waste, allowing decomposition and conversion into organic fertilizer.

12. Electricity Supply Structures: Consisting of electric poles, wires, and connections for supplying electric power to the farm.

13. Waste/Disposal Pits: Large pits dug on the farm's outskirts for disposing of waste and unused farm products, often covered to prevent the spread of germs by flies (vectors).

14. Fences: Physical barriers constructed around an area for various purposes, including preventing unwanted access, containing animals within the farm, controlling grazing, and protecting crops from damage by animals**.**

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**EVALUATION**

1. What is farm structure?
2. Mention and explain eight types of farm structures

FARM BUILDINGS

Farm buildings encompass all the structures present on a farm. The type, number, and size of these buildings depend on the type and scope of farm operations.

USES/IMPORTANCE OF FARM BUILDINGS

Farm buildings serve several essential functions:

1. They provide shelter to protect animals and farm workers from adverse weather conditions.
2. They safeguard farm supplies, products, animals, and workers from theft and harmful animals.
3. They offer a convenient environment for caring for farm animals.
4. They establish a hygienic system for processing and storing farm products.
5. They are essential for administrative and farm management purposes.

TYPES OF FARM BUILDINGS

Farm buildings are categorized into two main types:

1. Temporary Farm Buildings
2. Permanent Farm Buildings

TEMPORARY FARM BUILDINGS

Temporary farm buildings are simple structures constructed from affordable or locally available materials such as bamboo, sorghum stalks, wood (timber), palm fronds, mud, corrugated iron sheets, or asbestos. These buildings are typically cost-effective and can be easily abandoned or dismantled after use. Common examples include storage sheds for machines and equipment, nurseries for seedling cultivation, animal pens, construction sheds, and machine garages. Due to the materials used in their construction, temporary buildings require regular maintenance.

PERMANENT FARM BUILDINGS Permanent farm buildings are sturdy structures designed for long-lasting use. They typically have walls and floors constructed from materials like cement, sand, gravel, wood, corrugated iron sheets, aluminum, or asbestos for the roof. While they are more expensive to build, permanent structures do not require frequent maintenance like temporary ones. However, regular inspection and repair of roofing sheets are necessary. Examples of permanent farm buildings include:

1. Farm offices
2. Storage facilities for farm supplies and harvests
3. Workshops, generator houses, and water storage tanks
4. Living quarters for farm workers
5. Animal houses (e.g., cattle, sheep, goat, poultry)
6. Processing facilities (e.g., milking houses).

EVALUATION

1. Define farm structures and provide two examples.
2. List four examples of temporary farm buildings.

MAINTENANCE OF FARM STRUCTURES AND BUILDINGS

Maintenance of farm structures and buildings involves preserving these structures in good condition for continuous use. These structures are subject to wear and tear due to usage and exposure to adverse weather conditions. Additionally, damage from termites and exposure to agro-chemicals like fertilizers can contribute to wear and tear.

MAINTENANCE OF FARM STRUCTURES

1. Silos should be regularly cleaned and sealed to maintain an airtight environment. Any leaks should be promptly repaired.
2. Abattoirs should undergo thorough cleaning and disinfection after each operation.
3. Dips should be drained regularly to maintain their effectiveness.
4. Nozzles of sprayers should be cleaned to ensure an even distribution of chemicals during spraying.
5. Water tanks should be cleaned at regular intervals to prevent contamination.
6. Soak-away and manure pits should be emptied when full.
7. Drainage systems should be cleaned periodically using appropriate chemicals.
8. Electric poles must be regularly inspected for damage and promptly replaced if needed.
9. Fences should undergo regular checks, with any broken parts repaired.

MAINTENANCE OF FARM BUILDINGS

1. Painting is a recommended maintenance operation for wooden and metal parts of farm buildings. Areas exposed to rain should be treated with oil-based paint.
2. Damaged roofing sheets must be promptly replaced to prevent water leakage.
3. Cracks in walls should be patched to maintain structural integrity.
4. Severely worn cement floors should be resurfaced as needed.
5. Preventive chemicals such as Solignum should be applied to wooden parts to protect against insect damage.

GENERAL EVALUATION

1. Name two factors that contribute to wear and tear in farm structures and buildings.
2. Outline the maintenance methods for the following: a. Silos b. Nozzles of sprayers
3. Identify and define two types of farm buildings.
4. List three examples of temporary farm buildings.
5. List three examples of permanent farm buildings.

READING ASSIGNMENT Junior Secondary Agriculture for Nigerian Schools Bk 3 by A. Youdeowei, B.K .Kaigama, J.N. Ogbazi, S.O. Adesiyan. Chapter 8, Page 32-33 Prescribed Agricultural Science for Junior Secondary Schools. By S.A Omoruyi, U.X Orhue, A.A Akerobo, and C.I Aghimien. Pages 253-254.

WEEKEND ASSIGNMENT

1. Wooden and metal structures should be \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ to prevent wearing away. (a) Painted (b) colored (c) decorated (d) swept
2. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ should be cleaned and disinfected after each operation. (a) Silos (b) Poles (c) Abattoirs (d) Fences
3. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ should be cleaned and kept airtight. (a) silos (b) Poles (c) Abattoirs (d) Fences
4. The chemical that can be used to prevent the activities of insects on wooden materials is called: (a) sodium hydroxide (b) Solignum (c) potassium chloride (d) oxygen
5. A round farm structure constructed from mud with a grass or thatch roof is: (a) Barns (b) Rhumbus (c) Barns (d) Silos

THEORY

1. How can farm buildings be maintained?
2. State three farm structures and describe the methods for maintaining them.

Top of Form

**WEEK THREE**

TOPIC: SITING OF FARMS AND LAYOUT OF FARM STRUCTURES

CONTENT

- Factors guiding the siting of farms

- Factors guiding the layout of farm structures and buildings

- Importance of siting farm structures and buildings

A farm is a tract of land where crops are cultivated and animals are raised. The school farm serves as the practical site for students studying Agricultural Science.

FACTORS GUIDING THE SITING OF FARMS

1. Availability of Land: The first and foremost consideration is the availability of suitable land for farming.

2. Soil Quality: The chosen land should possess fertile soil to minimize the need for excessive fertilization. Soil that is waterlogged, rocky, or overused should be avoided. Well-drained soils such as loamy, sandy-loam, or clay-loam are preferred.

3. Water Supply: Farms must have proximity to a reliable water source for irrigation, processing, drinking, and equipment cleaning.

4. Proximity to School: The farm should be located reasonably close to the school to facilitate easy movement for both teachers and students and to enhance security against theft and vandalism.

5. Accessibility: Adequate roadways and paths are essential for efficient transportation of inputs and outputs.

6. Security: To protect against theft and safeguard farm produce and tools, the farm must be secure.

7. Slope of the Land: Choosing flat, level land helps reduce erosion and operational costs. The slope of the land influences the direction of beds or ridges and the type of erosion control measures required.

8. Aspect: The farm should not be surrounded by shading structures or tall trees that hinder photosynthesis. It should be fully exposed to solar radiation.

EVALUATION

1. What is a farm?

2. List six factors guiding the siting of farms.

FACTORS GUIDING THE LAYOUT OF FARM STRUCTURES AND BUILDINGS

Several factors should be considered when planning the layout of farm structures and buildings:

1. Soil Fertility: Construct structures on less fertile soil to maximize agricultural productivity on fertile land.

2. Topography: Select flat land for construction to minimize erosion risks.

3. Accessibility: Farm buildings should be strategically located for easy access, ideally near well-maintained roads.

4. Construction Materials: The availability of construction materials, such as cement blocks, bamboo, or sawn planks, must be considered based on the farmer's financial capacity.

5. Protection: Structures should be placed in areas that offer protection from excessive winds, erosion, and fire hazards.

GENERAL EVALUATION

1. What is a farm?

2. List five factors guiding the layout of farm structures and buildings.

3. Enumerate seven factors guiding the siting of farms.

4. Mention five importance of farm buildings.

5. Provide two reasons why a school farm is important.

READING ASSIGNMENT

Prescribed Agricultural Science for Junior Secondary Schools. By S.A Omoruyi, U.X Orhue, A.A Akerobo, and C.I Aghimien. Pages 253-254.

WEEKEND ASSIGNMENT

1. The first factor that must be considered before siting a farm is:

(a) Nearness to school

(b) Accessibility

(c) Availability of land

(d) Security

2. Protection of farm structures means:

(a) Presence of security

(b) Protection from wind and erosion

(c) Protection from thieves

(d) Vigilante watch

3. A flat level land should be used for the school farm for the following reasons except:

(a) To increase soil fertility

(b) To reduce erosion

(c) To reduce the cost of production

(d) To promote percolation

4. The best soil type for farming is:

(a) Sandy soil

(b) Clayey soil

(c) Loamy soil

(d) Sandy-clay soil

5. Monocotyledonous plants have \_\_\_\_\_\_\_\_.

(a) Four cotyledons

(b) Three cotyledons

(c) Two cotyledons

(d) One cotyledon

THEORY

1. State and explain two factors to be considered before siting farms.

2. Mention four uses of water in the farm.

**WEEK FOUR**

**TOPIC: CULTURAL PRACTICES**

**PRE-PLANTING OPERATIONS**

(A) Land Preparation

(B) Stumping

(C) Farm Layout

(D) Tillage

(E) Ridging

Cultural Practices: Cultural practices encompass the various methods employed to ensure the optimal growth and establishment of crops. These practices are categorized into pre-planting, planting, post-planting, harvesting, and storage operations.

PRE-PLANTING OPERATIONS

Pre-planting operations are carried out before the actual sowing of seeds. These operations play a crucial role in setting the stage for successful crop cultivation. Post-planting operations include activities such as thinning, supplying, irrigation, manuring, mulching, and weeding.

(a) Land Preparation: Land preparation involves the clearing of vegetation and grasses using cutlasses or hoes, as well as the felling of trees with axes. In some cases, mechanical equipment can also be employed for this purpose. It's important to note that burning the grasses and thrash is discouraged, as it depletes the organic matter content of the soil, including soil microbes.

(b) Stumping: Stumping refers to the removal of stumps left behind after trees have been cut on the farm. This can be done manually using cutlasses and axes or mechanically with bulldozers.

(c) Farm Layout: Farm layout involves the strategic division of farmland into sections, with each section being utilized to maximize crop yield.

(d) Tillage: Tillage is the process of breaking or turning the soil using simple tools or farm machinery after clearing the land in preparation for planting crops. It can be carried out manually with a hoe or mechanically using a tractor-driven disc plough. Ploughing, which involves cutting through the soil and creating lumps or clods called primary tillage, is followed by secondary tillage (harrowing) to break down large clods into fine particles, making the soil ready for ridging.

EVALUATION

1. What is a cultural practice?

2. Mention and explain three pre-planting operations.

IMPORTANCE OF TILLAGE

1. Soil loosening allows air and water to reach plant roots.

2. It facilitates root penetration into the soil.

3. Plant nutrients become accessible to plant roots.

4. Tillage aids in pest control by exposing them to sunlight.

5. Proper mixing of manure and fertilizer with the soil is ensured.

Ridging: Ridging involves creating raised rows or mounds on the farm, sometimes in intervals to prevent erosion on slopes. Ridges can also serve as a water source for plants and facilitate root penetration and crop establishment.

GENERAL EVALUATION

(1) What is land clearing?

(2) Define stumping.

(3) Define tillage and state three importance of tillage.

(4) What is ridging?

READING ASSIGNMENT

"Junior Secondary Agriculture for Nigerian Schools, Book 2" by A. Youdeowei, B.K. Kaigama, J.N. Ogbazi, S.O. Adesiyan. Chapter 9, pages 37 – 40.

WEEKEND ASSIGNMENT

1. Primary tillage is otherwise known as \_\_\_\_\_\_(a) harrowing (b) ploughing (c) ridging (d) stumping.

2. Secondary tillage is otherwise known as \_\_\_\_\_(a) harrowing (b) ploughing (c) ridging (d) stumping.

3. In farm layout, plots undergo \_\_\_\_\_\_\_ (a) division (b) multiplication (c) digging (d) covering.

4. The operation that follows tillage is (a) ridging (b) stumping (c) clearing (d) layout.

5. Stumping is carried out with the following except \_\_\_\_\_\_\_\_(a) gun (b) cutlass (c) bulldozer (d) axe.

THEORY

1. What is cultural practice?

2. Define the following terms: (a) land clearing (b) ridging.

**WEEK FIVE**

**TOPIC: PLANTING OPERATION – DISTANCE, DATE, SEED RATE, NURSERY, AND NURSERY PRACTICE**

**CONTENT**

- Definition of planting operation

- Planting methods

- Key considerations in planting operation

PLANTING OPERATION: Planting operations encompass the various tasks carried out when sowing planting materials, such as seeds. When seeds are sown in the soil, they undergo germination, leading to the emergence of young plants known as seedlings.

METHODS OF SOWING

1. In-situ (Directly into the Field/Farm Land)

2. Nursery

1. In-situ (Direct Sowing in the Field): This involves sowing seeds directly into the field, whether on flat, plain land, ridges, or garden beds. Examples of crops sown in-situ include maize, okra, cowpeas, and millet.

PLANTING METHODS:

- Drilling: This method entails sowing seeds by drilling with a stick or knife, followed by the placement of seeds and their subsequent covering.

- Broadcasting: Broadcasting involves spreading seeds broadly across a prepared seedbed.

- Dibbling: Dibbling is the method of sowing seeds at the planting point, placing them at the correct depth.

EVALUATION

1. What is the definition of planting operation?

2. Name three planting methods.

KEY CONSIDERATIONS IN PLANTING OPERATIONS:

- Spacing (Planting Space/Distance)

- Timing (Planting Date)

- Depth

- Seed Quantity

- Seed Viability

(A) SPACING (Planting Space): Spacing refers to the distance between sown or planted seeds. It is the gap between two plants. Planting is typically done in rows, and the distance between plants in the same row is called within-row spacing, while the distance between plants in two adjacent rows is termed between-row spacing.

(B) TIMING (Planting Date): Planting time is the period during which a crop can thrive and perform well.

(C) DEPTH OF PLANTING: This represents the distance of the sown seed in the soil from the soil surface.

(D) NUMBER OF SEEDS: This indicates the quantity of seeds sown per hole or planting point.

(E) SEED VIABILITY: Seed viability refers to the quality of the seed and its ability to germinate.

GENERAL EVALUATION

1. What is germination?

2. State two methods of sowing.

3. Define in-situ sowing.

4. List and explain five key considerations in planting operations.

READING ASSIGNMENT

"Junior Secondary Agriculture for Nigerian Schools, Book 2" by A. Youdeowei, B.K. Kaigama, J.N Ogbazi, S.O. Adesiyan. Chapter 10, pages 41 – 44, 48.

WEEKEND ASSIGNMENT

1. Which of the following is not a basic consideration in planting operations?

(a) Spacing (b) Depth (c) Time (d) Pod

2. When seeds are sown in soil and develop roots and shoots, this process is called

(a) Germination (b) Seedlings (c) Sowing (d) Development

3. The distance between two sown seeds/plants is called \_\_\_.

(a) Planting Space (b) Time (c) Planting Depth (d) Number of Seeds

4. Seeds are often raised in the nursery because

(a) The seedlings are weak (b) The seedlings are green (c) The seedlings love the nursery (d) They need sufficient sunlight

5. Planting depth refers to

(a) Planting Time (b) Planting Depth (c) Spacing (d) Number of Seeds

THEORY

1. What is planting operation?

2. Explain in-situ sowing.

3. Describe five key considerations in planting operations.

**WEEK SIX**

**TOPIC: POST-PLANTING OPERATION**

**POST-PLANTING OPERATIONS**

Post-planting operations are essential tasks conducted after the planting stage to create optimal conditions and ensure proper maintenance for plant growth. These operations are crucial for the successful development of crops and include the following:

(a) Thinning

(b) Supplying

(c) Irrigation/watering

(d) Use of manure and fertilizer

(e) Mulching

(f) Weeding

THINNING

Thinning involves the removal of excess, weak, or poorly positioned seedlings from a seedbed after viable seeds have germinated.

Advantages of Thinning:

1. It prevents overcrowding, allowing proper spacing between plants.

2. Thinning enhances proper aeration, leading to increased yield potential.

SUPPLYING

Supplying refers to the replanting of propagative materials when they fail to germinate, especially in cases where no germination trial was conducted before the initial planting. Replanting should be carried out promptly.

Advantages of Supplying:

1. It helps maintain the desired plant population.

2. Ensures uniform maturity of the crop.

IRRIGATION OR WATERING

Irrigation is the practice of artificially supplying water to farmland, especially during dry seasons.

Advantages of Irrigation:

1. It moderates soil temperature, promoting favorable conditions for plant growth.

2. It facilitates the supply of essential nutrients to plants.

USE OF MANURE & FERTILIZER

This operation involves applying organic manure, such as poultry droppings, cow dung, and green manure, or inorganic fertilizers (chemical-based) to the soil to maintain soil fertility.

Advantages of Manure/Fertilizer Application:

It supplies essential nutrients to the plants, promoting healthy growth and development.

MULCHING

Mulching entails covering the soil's surface with a layer of clean, dry vegetative parts of plants, such as grasses or leaves.

Advantages of Mulching:

1. It conserves soil moisture.

2. It regulates soil temperature.

3. It reduces weed growth and prevents soil erosion.

4. It adds organic matter (humus) to the soil.

EVALUATION

1. Define post-planting operations.

2. Mention two advantages of thinning.

WEEDING

Weeding involves the removal of unwanted plants, commonly referred to as weeds, from the farm. Weeding is necessary for several reasons:

1. To prevent competition for nutrients, moisture, and sunlight between crops and weeds.

2. To create adequate space for crop growth and development.

3. To reduce the buildup of pests and pathogens that can harm crops.

HARVESTING OPERATION

Harvesting is the process of gathering mature or ripe parts of a crop for use. Commonly harvested parts include tubers, leaves, fruits, seeds, and roots. Harvesting tools such as cutlasses, hoes, knives, sickles, and mechanized harvesters are used in this process.

EFFECTS OF TIMELY VERSUS LATE HARVESTING

Timely harvesting is essential, as delayed harvesting can lead to significant consequences, including the risk of total crop loss. While some crops like maize can be left in the field to dry before harvesting, others like tomatoes and perishables must be harvested promptly to prevent pest infestation or spoilage.

POST-HARVESTING OPERATIONS

After harvesting, processing of the produce is often required to enhance acceptability and prevent spoilage. Some processing may start on the farm itself, as in the case of melon, groundnut, and cassava. Others, like milling and de-husking, are performed in specialized facilities equipped with machinery.

STORAGE

Once crops have been processed into usable forms, they need to be stored for future use. Storage methods include the use of barns, cribs, silos, refrigerators, baskets, sacks, and more.

GENERAL EVALUATION

1. Define post-planting operations.

2. What is harvesting?

3. List five harvesting tools.

4. Mention two consequences of delayed harvesting.

READING ASSIGNMENT

Refer to "Prescribed Agricultural Science for Junior Secondary Schools, Book 3" by A. Youdeovei, pages 141-142.

WEEKEND ASSIGNMENT

1. Harvesting involves the removal of -------- crops.

A. big

B. matured

C. small

D. smooth

2. Harvesting tools include the following except:

A. basket

B. knife

C. harvester

D. secateurs

3. One of the effects of late harvesting is:

A. increase of harvest

B. loss of product

C. sale of product

D. enhanced market

4. One of the reasons for processing is:

A. to increase the quantity of the product

B. to make it scarce

C. to prevent spoilage

D. to increase demand

5. Methods of storage include the following except:

A. use of barns

B. use of shops

C. use of baskets

D. use of silos

THEORY

1. What is storage?

2. Mention two crops whose processing starts from the farm.

**WEEK SEVEN**

**FARMING SYSTEM: TYPES OF FARMING SYSTEMS**

Introduction:

A farming system refers to a specific method employed for the cultivation of crops and rearing of animals. The choice of a farming system is influenced by factors such as soil quality, climate, and the availability of land. In this discussion, we will explore three common types of farming systems:

A) Mixed Farming:

Mixed farming is a comprehensive approach where farmers engage in both crop cultivation and animal husbandry on the same piece of land.

Advantages of Mixed Farming:

1. Utilization of animal droppings and dung as natural fertilizers to enhance soil fertility, resulting in increased crop yields.

2. Crop residues, such as corn cobs and rice bran, can be used as valuable feed for ruminant animals.

3. Large animals, like cattle, can assist in plowing the fields for crop cultivation.

4. In case of a failure in either the crop or animal sector, farmers have the other component to rely on.

Disadvantages of Mixed Farming:

1. The farmer's attention is divided between crops and animals, potentially affecting overall productivity.

2. Improper management of animals can lead to them grazing on cultivated crops, causing damage.

B) Bush Fallowing or Shifting Cultivation:

Bush fallowing, also known as shifting cultivation, involves farmers abandoning unproductive land in favor of fertile soil. The unproductive land is left fallow or unused for a specific period, typically 3-5 years before being returned to agricultural use. In shifting cultivation, farmers do not return to the previously used land.

Advantages of Bush Fallowing:

1. It is a cost-effective and straightforward practice.

2. Extended fallow periods can be less harmful to the soil.

3. Adequate fallow periods can help maintain soil fertility for future crop production.

Disadvantages of Bush Fallowing:

1. It requires extensive land for effective implementation.

2. Bush fallowing is often used for land clearance, leading to reduced organic matter in the soil.

3. If fallow periods are too short, soil fertility may quickly deteriorate, rendering it unsuitable for further crop cultivation.

C) Pastoral Farming:

Pastoral farming represents an extensive livestock production system where animals are allowed to roam and graze freely in open fields. There are three primary types of pastoral farming:

1. Nomadic Farming:

In this system, farmers constantly move their animals in search of suitable grazing areas and water sources.

2. Ley Farming:

Ley farming involves combining pasture and crop production in alternation. Pasture planting can follow the harvest of arable crops like cereals. Pasture is typically a mix of grasses and legumes with different grazing characteristics.

3. Ranching:

Ranching is a semi-intensive system of animal production where animals are kept on a large, enclosed piece of land.

Advantages of Pastoral Farming:

1. Animals kept on pasture tend to be more comfortable and sanitary than those confined indoors in feedlots.

2. Grazing allows livestock to efficiently harvest pasture crops, reducing labor costs.

3. Minimal financial investment is required for infrastructure and equipment.

4. The dropping of manure by animals helps improve soil fertility.

5. Pasture-raised animals often produce more milk than those kept indoors in feedlots.

Disadvantages of Pastoral Farming:

1. Extensive land is necessary for successful implementation.

2. Both animals and herders are exposed to various hazards.

3. Unplanned breeding can lead to the production of poor-quality animals.

4. Irregular feed supply can result in slow weight gain.

5. There is a higher risk of diseases, pests, and mortality among animals.

Conclusion:

Farming systems play a crucial role in agricultural practices, shaping the way crops are grown and animals are raised. Each system has its unique advantages and disadvantages, making it essential for farmers to carefully consider their specific circumstances and objectives when choosing a farming approach.

Evaluation

1. Define a farming system.

2. Distinguish between mixed farming and mixed cropping.

3. State two advantages and disadvantages of bush fallowing.

4. Explain the concept of nomadic farming.

Reading Assignment:

Refer to "Junior Secondary Agricultural Science for Nigerian Schools Book 3" by A. Youdeovei, pages 2-6.

Weekend Assignment:

1. Which of these farming systems involves crop production?

(a) Ley farming

(b) Ranching

(c) Mixed farming

(d) Nomadic farming

2. How many years is land typically left to rest in bush fallowing?

(a) 3-5 years

(b) 7-10 years

(c) 15-20 years

(d) 20-30 years

3. In which of these farming systems is both crop production and animal rearing practiced?

(a) Mixed farming

(b) Pastoral farming

(c) Bush fallowing

(d) Ranching

4. Ranching is a form of what type of animal production system?

(a) Extensive

(b) Semi-intensive

(c) Intensive

(d) Semi-extensive

5. In which of these farming systems is pasture grown for farm animals?

(a) Ley farming

(b) Mixed farming

(c) Bush fallowing

(d) Shifting cultivation

Theory:

1. State two disadvantages of mixed farming.

2. Explain the concept of nomadic farming.

**WEEK EIGHT**

**TOPIC: TYPES OF CROPPING SYSTEM**

**TYPES OF CROPPING SYSTEMS**

Introduction:

Cropping systems refer to the various approaches used for growing crops and combinations of crops in agriculture. These systems play a vital role in determining agricultural practices. In this discussion, we will explore different types of cropping systems.

a) Monocropping:

Monocropping is a farming system in which only one type of crop is grown on a farm at any given time, such as an oil palm plantation.

Advantages of Monocropping:

1. Facilitates mechanization of farming operations.

2. Allows precise application of fertilizers.

3. Simplifies weed, pest, and disease control.

Disadvantages of Monocropping:

1. Increases the risk of soil erosion after harvest.

2. Vulnerability to severe pest or disease outbreaks.

3. Potential price reduction due to oversupply in the market.

b) Multiple Cropping:

Multiple cropping involves cultivating two or more crops on the same farm within a single year. There are two primary types of multiple cropping:

1. Relay Cropping:Involves sequentially growing two or more crops on the same farm during the same year.

2. Inter Cropping: Encompasses simultaneously growing different crops on the same farm.

Advantages of Multiple Cropping:

1. Optimizes land usage, maximizing productivity.

2. Soil cover provided by mixed crops reduces soil erosion and weed growth.

3. Crop diversity discourages the buildup of specific pests and diseases.

4. Acts as an insurance for farmers against crop failures.

Disadvantages of Multiple Cropping:

1. Intense competition among crop plants, leading to reduced yields for less competitive plants.

2. Limited use of machinery for farm operations.

3. Challenges in applying chemicals, especially herbicides, to mixed crops.

c) Continuous Cropping:

Continuous cropping involves cultivating the same crop or a combination of crops on the same land year after year for five or more years.

Advantages of Continuous Cropping:

Useful in scenarios of land scarcity and environmental conditions that restrict the types of crops that can be grown.

Disadvantages of Continuous Cropping:

1. Rapid depletion of soil nutrients, necessitating fertilizer applications.

2. Frequent buildup of weeds, insect pests, and diseases with each cropping cycle.

General Evaluation:

1. Define monocropping.

2. List two advantages of monocropping.

3. Explain what multiple cropping entails.

4. Define continuous cropping.

5. Mention two disadvantages of continuous cropping.

6. Differentiate between crop rotation and land rotation.

Reading Assignment:

Refer to "Junior Secondary Agricultural Science" by A. Youdeowei, Book 3, Chapter 2, Pages 7-11.

Refer to "Junior Secondary Agricultural Science" by O. Akinsanmi, Chapter 6, Pages 25-26.

Weekend Assignment

1. The term used to describe different patterns of growing crops and combinations of crops is known as ………..

(a) multiple cropping

(b) sole cropping

(c) cropping system

(d) continuous cropping

2. The system in which only one kind of crop is planted is called ………..

(a) multiple cropping

(b) monocropping

(c) mixed cropping

(d) mixed farming

3. Planting more than one crop on a piece of land at the same time is ………..

(a) mixed farming

(b) multiple cropping

(c) monocropping

(d) mono farming

4. Which of the following is not an agricultural cropping system?

(a) mixed farming

(b) crop rotation

(c) monocropping

(d) multiple cropping

5. This is the growing of crops on the same piece of land non-stop for a very long time.

(a) multiple cropping

(b) sole cropping

(c) cropping system

(d) continuous cropping

Theory:

1. State two advantages of multiple cropping.

2. Enumerate two disadvantages of monocropping.

**WEEK NINE**

Farm / field work

**WEEK TEN**

Revision

**WEEK ELEVEN**

EXAMINATION