THE UNITED REPUBLIC OF TANZANIA

NATIONAL EXAMINATION COUNCIL OF TANZANIA

DIPLOMA IN SECONDARY EDUCATION EXAMINATION

735 **AGRICULTURE TEACHING METHODS**

Time: 3 Hour. **ANSWERS** **Year: 2001**

Instructions

1. This paper consists of section **A** and **B**.
2. Answer **all** questions in section A, and **four (4)** questions from section B.
3. Section A carry **forty (40)** and section B carries **sixty (60)** marks.
4. Cellular phones are **not** allowed in the examination room.
5. Write your **Examination Number** on every page of your answer booklet(s).

1. Mention four ways through which soil structure can be destroyed during farming activities.

Continuous tilling or ploughing of the soil breaks down soil aggregates, making the soil loose and prone to erosion and compaction.

Overgrazing by animals leads to trampling, which compacts the soil, reducing pore spaces and destroying its natural structure.

Excessive irrigation, especially on poorly drained soils, leads to waterlogging, which breaks down soil aggregates and removes important binding agents.

Use of heavy machinery on wet soils compacts the layers, disrupts the soil profile, and destroys natural air and water flow channels.

2. Give four criteria used when selecting seeds for planting in school farms.

Seeds must be of high viability, meaning they have a high percentage of germination under ideal conditions to ensure a good plant population.

They should be free from pests and diseases, as infected seeds may introduce problems to the entire crop.

Seeds should be of a known and improved variety that suits the local climate and soil conditions to maximize yield.

They should be certified or sourced from reliable suppliers to ensure quality and authenticity.

3. List four signs of a healthy animal observable during livestock inspection.

A healthy animal has bright, alert eyes and shows active behavior, moving freely without limping.

The skin and coat appear smooth, shiny, and free from wounds, swellings, or parasites.

The animal eats and drinks normally and shows a consistent appetite throughout the day.

Body condition is appropriate for the species, neither too thin nor excessively fat, indicating good nutrition and absence of disease.

4. Identify four reasons for conducting spacing during crop planting.

Proper spacing reduces competition among plants for nutrients, water, and sunlight, leading to healthier growth.

It ensures good air circulation, which helps prevent the buildup of humidity and the spread of fungal diseases.

It facilitates easier access for weeding, pest control, and harvesting activities without damaging crops.

Spacing allows plants to reach their full yield potential by providing enough room for root and canopy development.

5. Mention four roles played by potassium in plant growth and development.

Potassium strengthens plant cell walls, which helps plants resist physical stress and diseases.

It improves the efficiency of water use by regulating the opening and closing of stomata.

Potassium enhances the formation and movement of starches and sugars, thus contributing to the overall energy balance of the plant.

It increases crop quality by improving fruit size, color, and shelf-life, especially in fruits and vegetables.

6. State four control measures against bacterial diseases in vegetable crops.

Use disease-free and certified seeds or planting materials to prevent initial infection in the field.

Practice crop rotation with unrelated crops to break the disease cycle in the soil.

Avoid working in the garden when the plants are wet, as bacteria spread easily through water and human activity.

Remove and properly dispose of infected plant parts or entire plants to limit the spread of bacteria to healthy crops.

7. Explain five disadvantages of monoculture in school agricultural production and suggest five practices that reduce its negative effects.

Monoculture increases vulnerability to pests and diseases, since a single crop provides a uniform host for organisms to thrive.

It leads to faster depletion of specific nutrients from the soil because the same crop absorbs similar nutrients season after season.

Monoculture limits biodiversity, reducing resilience of the farm ecosystem and long-term sustainability.

Over-reliance on one crop can cause total loss during disease outbreak or drought, affecting food security.

It may lead to soil erosion due to reduced ground cover when the crop is harvested all at once.

Practices to reduce these effects include intercropping to introduce variety and break pest cycles.

Crop rotation helps to restore soil fertility and disrupt disease and pest life cycles.

Incorporating cover crops reduces erosion and improves soil organic matter.

Applying organic manure or compost restores lost nutrients and improves soil health.

Using resistant crop varieties reduces the risk of widespread disease and pest attacks.

8. A school garden project grew 1,200 heads of cabbage in a season. Each cabbage head weighed 1.8 kg. The market price was 1,500 TZS per kg.
(a) **Calculate the total yield in kilograms.** Total yield = 1,200 x 1.8 = 2,160 kg

(b) **Find the total income earned.**
Total income = 2,160 kg x 1,500 = 3,240,000 TZS

(c) **If total production costs were 1,200,000 TZS, calculate the profit.**
Profit = 3,240,000 – 1,200,000 = 2,040,000 TZS

(d) **What is the profit per cabbage head?**
Profit per head = 2,040,000 ÷ 1,200 = 1,700 TZS

(e) **List two reasons why record-keeping of this project is necessary.**
It helps in tracking expenses and income to determine profitability and make informed decisions in future projects.
Records provide data that can be used to improve planning, budgeting, and student learning from the project outcomes.

9. Describe five environmental conditions that favour the successful growth of Irish potatoes and five management practices needed after planting.

Cool temperatures between 15°C to 20°C promote proper tuber formation and reduce disease incidence.

Irish potatoes require well-drained, fertile loamy soil rich in organic matter for good root and tuber development.

Moderate rainfall, around 800–1,200 mm per year, is ideal, but too much rain can cause waterlogging and rot.

The crop thrives in areas with high altitude, as cooler climates reduce pest and disease pressure.

Soil pH should be slightly acidic, around 5.5 to 6.5, for optimal nutrient availability and root development.

After planting, earthing-up is needed to prevent greening and exposure of tubers to sunlight.

Regular weeding reduces competition and maintains soil moisture.

Application of organic and inorganic fertilizers boosts growth and yield.

Irrigation during dry spells ensures continuous tuber development.

Monitoring and controlling pests like potato beetles and diseases like late blight protect crop health.

10. Explain five factors to consider when constructing animal housing and five consequences of poor housing in livestock production.

The house should be well-ventilated to allow fresh air in and reduce respiratory diseases.

It should be constructed on well-drained ground to avoid waterlogging and dampness.

Housing should provide enough space per animal to avoid overcrowding and stress.

Strong and durable materials should be used to withstand harsh weather and protect animals from predators.

Proper orientation (e.g., east-west) helps in maximizing natural light and airflow.

Poor housing leads to disease outbreaks due to damp and dirty conditions.

Overcrowding causes injuries, stress, and stunted growth among animals.

Leakages from roofs and walls make animals cold and uncomfortable, reducing productivity.

Pests and predators can enter easily in poorly secured housing, causing losses.

It leads to high maintenance costs due to frequent repairs and replacements.

11. A teacher wants to introduce compost manure production in the school. Explain five steps for preparing compost manure and five precautions to observe during its production.

The first step is selecting a suitable site that is well-drained, shaded, and near a water source. This ensures composting conditions remain stable and accessible for management.

The second step involves collecting composting materials, including green materials such as fresh grass and vegetable waste, and dry materials like dry leaves and maize stalks.

The third step is layering the materials alternately in a pit or heap, starting with dry materials at the bottom, followed by green materials, and adding animal manure or topsoil to introduce decomposing microorganisms.

The fourth step is moistening the pile with water to provide the necessary moisture for microbial activity and then covering it with grass or banana leaves to retain heat and moisture.

The fifth step involves turning the compost every 2 to 3 weeks to aerate the pile and speed up decomposition. After 6 to 8 weeks, the compost will be ready when it turns dark brown with an earthy smell.

One precaution is to avoid adding diseased plants or meat scraps, which may introduce harmful organisms or attract scavengers.

Overwatering should be avoided, as it may make the pile anaerobic and slow down decomposition.

Too much dry matter without green materials can slow down microbial activity, so a good balance must be maintained.

Compost should be covered during heavy rains to prevent leaching of nutrients and nutrient loss.

Sharp objects or plastics should be excluded to avoid contamination and ensure safety for users.

12. Write short notes on each of the following agricultural tools:

(a) Pruning saw

A pruning saw is used for cutting thicker branches that cannot be cut with secateurs. It has a curved blade with sharp teeth and is used to maintain plant shape and remove dead or diseased wood.

(b) Grafting knife

This is a specialized knife with a straight, sharp blade used for making clean cuts during grafting. It allows smooth cuts on both scion and rootstock to ensure tight contact for successful grafting.

(c) Dibber
A dibber is a pointed wooden or metal tool used to make holes in the soil for planting seeds or transplanting seedlings. It ensures correct depth and reduces damage to roots during transplanting.

(d) Rake
A rake is used for levelling soil, collecting debris, and breaking clods after tilling. It has a long handle and a set of straight or slightly curved teeth attached to a metal bar.

(e) Wheelbarrow
A wheelbarrow is a transport tool with one or two wheels used to carry manure, seedlings, or harvested produce around the farm. It helps reduce labour and improve efficiency.

13. You are planning a school project on layer chicken production. Prepare a proposal that includes:
(a) Project objectives
To produce eggs for school consumption and sale, train students in poultry management, and generate income to support agricultural learning activities.

(b) Facilities and equipment required
Chicken house with proper ventilation, laying nests, feeders, drinkers, perches, lighting system, and storage for feed and eggs.

(c) Budget summary
Costs include purchase of 100 layer chicks, feeds for six months, vaccines, housing construction, labour, and miscellaneous expenses, totaling approximately 2,500,000 TZS.

(d) Risks and risk management
Risks include disease outbreaks (managed through vaccination), feed shortages (mitigated by advance purchase), and theft (controlled by secure housing and supervision).

(e) Expected outcomes and evaluation method
Expected outcomes include regular egg production, student skill acquisition, and improved school nutrition. Evaluation will be through egg production records, student reports, and financial records.

14. Write an essay explaining five factors that cause low crop productivity in Tanzania and five longterm strategies to improve crop production in secondary schools.

Low soil fertility due to continuous cultivation without replenishment leads to reduced crop yields over time.

Limited access to quality seeds and inputs prevents farmers from maximizing their land’s potential.

Unreliable rainfall patterns caused by climate change affect crop growth and harvest timing.

Poor pest and disease control measures allow widespread damage to crops, reducing yield significantly.

Lack of agricultural extension services leaves farmers with little guidance on best practices and new technologies.

Improving soil fertility through use of organic and inorganic fertilizers helps restore lost nutrients.

Introducing irrigation systems reduces reliance on rain-fed agriculture and ensures continuous production.

Promoting use of certified seeds improves germination, resistance to diseases, and final yield.

Encouraging integrated pest management ensures sustainable control of pests while protecting the environment.

Establishing school demonstration plots trains students practically and boosts productivity through applied knowledge.

15. A student is asked to prepare a lesson on classification of crops.
(a) Describe five criteria used to classify crops and provide examples for each.

By use: Food crops (e.g. maize), cash crops (e.g. cotton), industrial crops (e.g. sugarcane), and medicinal crops (e.g. aloe vera).

By life span: Annual crops (e.g. beans), biennial crops (e.g. carrots), and perennial crops (e.g. coffee).

By botanical family: Legumes (e.g. cowpeas), grasses (e.g. wheat), and solanaceae (e.g. tomatoes).

By growth habit: Climbers (e.g. passion fruit), creepers (e.g. pumpkin), and erect plants (e.g. sorghum).

By water requirement: Upland/dryland crops (e.g. millet) and wetland crops (e.g. paddy rice).

(b) Explain five reasons why such classification is important in agricultural learning.

It helps learners understand the characteristics, care, and uses of different crops.

It supports proper crop rotation planning by grouping crops with similar needs or vulnerabilities.

It simplifies teaching and curriculum design by organizing information into manageable categories.

It enhances identification of suitable crops for different climates, soils, and economic needs.

It fosters understanding of plant relationships, helping in pest and disease control and breeding programs.

16. Describe five contributions of agriculture to national development and five challenges facing the agricultural sector in Tanzania today.

Agriculture contributes to national food security by producing the majority of the food consumed domestically. This reduces dependence on imports and ensures a stable food supply.

It is a major source of employment, especially in rural areas, where it absorbs a large portion of the working population and reduces rural-urban migration.

Agriculture provides raw materials for local industries such as textile (cotton), beverage (sugarcane), and oil processing (sunflower), supporting industrial development.

The sector contributes to foreign exchange earnings through exports of cash crops like coffee, tea, and tobacco, which boosts the country's economy.

It serves as a source of government revenue through taxes, levies, and licenses associated with agricultural products and services.

Challenges include unpredictable weather patterns and climate change, which reduce yields due to droughts or floods.

There is low access to quality inputs such as improved seeds, fertilizers, and pesticides, which limits productivity.

Inadequate infrastructure such as poor roads and storage facilities causes post-harvest losses and high transport costs.

Limited extension services mean that farmers do not receive proper training or access to new agricultural technologies.

Land degradation due to deforestation, overgrazing, and poor farming methods reduces the land’s long-term productivity.

17. A school is introducing an agroforestry project. Explain five advantages of agroforestry and five practices involved in managing such a system.

Agroforestry improves soil fertility through nitrogen-fixing trees and leaf litter, which decompose and return nutrients to the soil.

It reduces erosion by providing ground cover and stabilizing the soil with tree roots.

The system increases biodiversity, creating a balanced ecosystem and reducing pest outbreaks.

Trees provide shade and windbreaks, improving the microclimate for crops and animals.

It offers multiple income streams from timber, fruits, honey, and medicinal plants, boosting farm resilience.

Practices include selecting appropriate tree species that are compatible with crops and local environmental conditions.

Proper spacing of trees is required to minimize competition with crops for sunlight, nutrients, and water.

Pruning and thinning are done regularly to manage tree canopy and ensure light reaches understory crops.

Use of alley cropping, where trees are grown in rows and crops in between, balances productivity.

Integration of livestock must be controlled through rotational grazing to prevent damage to young plants.

18. Discuss five reasons for promoting youth engagement in agriculture and five barriers that discourage youth from participating in farming activities.

Involving youth ensures generational sustainability of the agricultural sector as older farmers retire.

Youth bring energy, creativity, and adaptability, especially in adopting modern technologies in farming.

It reduces youth unemployment and creates opportunities for self-employment through agribusiness.

Engaging youth can boost food production and reduce national dependence on imported food.

Youth participation strengthens rural development by increasing economic activity and community resilience.

Barriers include limited access to land due to cultural norms or lack of inheritance rights for young people.

Lack of capital and financial support discourages youth from starting agricultural projects.

Agriculture is often viewed as dirty, low-status work, reducing its appeal among educated youth.

Inadequate training and exposure to modern agricultural practices lead to low confidence in pursuing it.

Unreliable markets and price fluctuations make farming appear too risky and unprofitable to youth.