INTRODUCTION

This syllabus has been compiled with a view to accomplishing two fundamental objectives. First, the learners should develop basic principles of agricultural production relevant to Kenya in general, and specifically to their own environments. Secondly, learners should be involved in practical work that aims at assisting them to acquire useful agricultural skills. Therefore, it is highly recommended that learners be involved in practical work for actual agricultural production.

Affective domain objectives in agriculture are as important as those in cognitive and psychomotor domains. However, they must not be seen as achievable at the end of each single topic. They are long term objectives and are set out in the general rather than specific objectives. The teacher must not forget them in teaching and in assessment.

The syllabus covers crop production, livestock production, farm power and machinery, farm structures, agricultural economics and agroforestry. These are distributed throughout the four-year course.

An attempt has been made to arrange the topics in a logical sequence. However, due to different ecological zones and weather pattern in the country, teachers are advised to take into account these differences when developing their schemes of work. They should also endeavour to cover the syllabus within the allocated time. In topics on crop and livestock production, teachers should select examples which are most suited to their ecological zones. It is highly recommended that a crop museum be established in each school. Students should also be encouraged to plant suitable trees in their schools and label them using common and botanical names for each tree.

Each school is encouraged to harvest its rain water from the roof catchments, hold it in reservoirs and use it for irrigation and for livestock, among other uses. Rain water harvesting does not rely on safe cheap water to the school, but also prevents soil erosion and undermining of building foundations. Agricultural and other related activities must not be used as punishment for wrong doers.

At the end of this syllabus are appendices on lists of tools, seeds, pests and diseases to be studied. However, teachers are encouraged to innovate and to use local resources in teaching. A guide on learner/assessment and self evaluation is given in appendix II.
GENERAL OBJECTIVES

The Secondary Agriculture course aims to:

1. Develop an understanding of agriculture and its importance to the family and the nation.
2. Promote interest in agriculture as an industry and create awareness of opportunities existing in agriculture and related sectors.
3. Demonstrate that farming is a dignified and profitable occupation.
4. Enhance skills needed in carrying out agricultural practices.
5. Provide a background for further studies in agriculture.
7. Develop occupational outlook in agriculture.
8. Enable schools to take an active part in national development through agricultural activities.
9. Create awareness of the role of agriculture in industrial and technological development.
10. Enhance understanding of the role of technology and industrialization in agricultural development.
11. Promote agricultural activities which enhance environmental conservation.
12. Promote consciousness of health promoting activities in agricultural production.
1.0.0 INTRODUCTION TO AGRICULTURE (5 Lessons)

1.1.0 Specific objectives
By the end of the topic, the learner should be able to:

a) define agriculture
b) state the main branches of agriculture
c) describe farming systems
d) explain the role of agriculture in the economy and demonstrate an appreciation of its importance to the country
e) demonstrate an appreciation for the wide and varied opportunities in agriculture.

1.2.0 Content
1.2.1 Definition of agriculture
1.2.2 Branches of agriculture

• Crop-farming (Arable farming)
  i) Field crops
  ii) Horticulture
     (flower farming)
  iii) Olericulture
     (vegetable farming)
  iv) Pomoculture (fruits farming)
• Livestock farming
  i) Pastoralism - mammalian livestock farming
  ii) Fish farming (Aquaculture)
  iii) Poultry keeping
• Agriculture economics
• Agricultural engineering

1.2.3 Systems of farming

• Extensive
• Intensive
• Large scale farming
• Small scale farming

Note: Study each of the above systems under:

- Meaning
- Advantages
- Disadvantages

1.2.4 Methods of farming

• Mixed farming
• Nomadic pastoralism
• Shifting cultivation
• Organic farming
• Agroforestry

Note: Learners should be reminded that any of the above methods can be subsistence or commercial

1.2.5 Roles of agriculture in the economy

• Food supply
• Source of employment
• Foreign exchange earner
• Source of raw materials for industries
• Provision of market for industrial goods
• Source of capital

2.0.0 FACTORS INFLUENCING AGRICULTURE (21 Lessons)

2.1.0 Specific objectives
By the end of the topic, the learner should be able to:

a) explain the human factors influencing agriculture
b) explain basic factors influencing agriculture
c) explain how climatic factors influence agriculture
d) define soil
e) describe the process of soil formation
f) describe soil profile
g) determine soil constituents
b) classify soils by physical characteristics
i) explain chemical properties of soils
j) relate crop and livestock distribution to soils in different regions.

2.2.0 Content

2.2.1 Human factors
- Levels of education and technology
- Health - HIV/AIDS and health in general
- Economy (include liberalization)
- Transport and communication
- Market forces (local and international)
- Government policy
- Cultural and religious beliefs

2.2.2 Biotic Factors
- Pests
- Parasites
- Decomposers
- Pathogens
- Predators
- Pollinators
- Nitrifying bacteria

2.2.3 Climatic Factors
- Rainfall
  - intensity
  - reliability
  - quantity
  - distribution
- Temperature
  - How topography and altitude affect temperature
  - How temperature influences crop and livestock production
- Wind
  - Evapotranspiration
  - Lodging
  - Pollination
  - Seed dispersal
  - Soil erosion (note section 21.2.1)
- Light
  - Intensity

- Duration - long, neutral and short day plants
- Wavelength

Note: Each factor to be discussed with respect to the following:
- Land potentiality
- Crop production
- Livestock production
- Crop and livestock distribution in Kenya

2.2.4 Edaphic factors
- Definition of soil
- Soil formation
- Soil profile
  - Definition
  - Characteristics of different soil layers
  - Difference between soil formed in situ and depositions
  - Soil depth and its influence on crop production

- Soil constituents
  - Constituents (demonstrate presence of each)
  - Importance of each constituent
- Physical properties of soil
  i) Soil structure
    - Definition
    - Types
    - Influence on crop production
  ii) Soil texture
    - Definition
    - Soil texture classification
    - Influences on crop growth and production, porosity, capillarity, drainage and water retention capacity.
  iii) Soil colour
    - Chemical properties of soil
      - Soil pH
      - pH influence on crop growth and production
      - Effects of pH on mineral
3.0.0 FARM TOOLS AND EQUIPMENT
(7 Lessons)

3.1.0 Specific objectives
By the end of the topic, the learner should be able to:

a) identify various farm tools and equipment
b) name parts of various farm tools and equipment
c) describe the use of various tools and equipment
d) carry out maintenance practices on tools and equipment
e) demonstrate an appreciation for care and maintenance of tools.

3.2.0 Content

3.2.1 Garden tools and equipment
- Woodwork tools and equipment
- Metalwork tools and equipment

3.2.2 Workshop tools and equipment
- Woodwork tools and equipment
- Metalwork tools and equipment

3.2.3 Livestock production tools and equipment

3.2.4 Plumbing tools and equipment

3.2.5 Masonry tools and equipment

Note: Study the above tools under the following headings:
- Name and uses
- Parts and uses
- Maintenance practices

Note: (see Appendix 1 for list of tools and equipment to be studied)

4.0.0 CROP PRODUCTION I
(LAND PREPARATION) (7 Lessons)

4.1.0 Specific objectives
By the end of the topic, the learner should be able to:

a) explain the importance of land preparation
b) describe the various types of cultivation
c) relate each cultivation operation to correct tools and implements
d) prepare a piece of land ready for crop production.

4.2.0 Content

4.2.1 Land preparation
- Definition
- Importance

4.2.2 Operations in land preparation
- Clearing land before cultivation
  - Importance (include clearing as a method of land reclamation)
  - Methods and equipment
- Primary cultivation
  - Definition and importance
  - Timing
  - Choice of tools and implements
- Secondary cultivation
  - Definition and importance
  - Number of operations
  - Correct tools and implements for different operations
  - Relating final till to the intended planting material
- Tertiary operations
  - Ridging
  - Rolling
  - Levelling

Note: For each type:
- give reasons
- explain how it is carried out
- Sub-soiling
- Meaning
- Importance
- Equipment used

4.2.3 Minimum tillage
- Definition
- Importance
- Practices
5.0.0 WATER SUPPLY, IRRIGATION AND DRAINAGE (10 Lessons)

5.1.0 Specific objectives
By the end of the topic, the learner should be able to:

a) state the sources of water for the farm
b) describe collection, storage, pumping, and conveyance of water,
c) describe water treatment and explain its importance
d) define irrigation
e) explain the importance of irrigation
f) describe methods of irrigating land
g) list the equipment used in irrigation
h) grow a crop through irrigation
i) carry out maintenance on irrigation equipment and facilities
j) define drainage
k) explain the importance of drainage
l) describe the methods of drainage
m) explain how agricultural activities pollute water and how this can be prevented
n) demonstrate an appreciation for clean water in farming and life in general.

5.2.0 Content

5.2.1 Water supply
- Sources of water
- Collection and storage of water
- Pumps and pumping
- Conveyance of water
  - Piping: - types of pipes
  - Choice of pipes
  - Canals
  - Transportation in containers
- Water treatment
  - Meaning
- Methods
  - Importance
- Uses of water on the farm

5.2.2 Irrigation
- Definition
- Importance (include irrigation as a method of land reclamation)
- Methods
  - Surface
  - Sub-surface
  - Overhead
  - Drip

Note: Discuss advantages and disadvantages of each method
- Maintenance practices of each irrigation system

5.2.3 Project on crop production through any method of irrigation

5.2.4 Drainage
- Definition
- Importance (include as a method of land reclamation)
- Methods of drainage
  - Surface
  - Sub-surface
  - Pumping
  - Planting of appropriate trees

5.2.5 Water Pollution
- Meaning
- Agricultural practices that pollute water
- Methods of pollution prevention and control

5.0.0 SOIL FERTILITY I (ORGANIC MANURES) (6 Lessons)

6.1.0 Specific objectives
By the end of the topic, the learner should be able to:

a) define soil fertility
b) explain how soil fertility can be maintained
c) describe how soil loses fertility
d) define and distinguish organic matter, manure and humus
e) explain the importance of organic matter in the soil
f) describe the different organic manures
g) prepare compost manure; demonstrate a caring attitude towards soil.

6.2.0 Content
6.2.1 Soil fertility
  • Definition
  • How soil loses fertility
  • Maintenance of soil fertility

6.2.3 Organic Manure
  • Organic matter and humus
  • Importance of organic matter in the soil
  • Types of organic manures
    - Green manure
    - Farm-yard manure
    - Compost manure

Note: For each type, describe its preparation, advantages and disadvantages and use.

6.2.3 Compost manure:
  • Meaning
  • Materials used and materials to avoid
  • Preparation methods and procedure
    - Heap
    - Pit

7.0.0 LIVESTOCK PRODUCTION 1 (COMMON BREEDS) (7 Lessons)

7.1.0 Specific objectives
By the end of the topic, the learner should be able to:
  a) name various livestock species
  b) define the terms livestock, breed and type
  c) describe the various breed characteristics
d) state the origin of various livestock breeds
e) classify the various breeds into types
f) name the external parts of the various livestock species
g) demonstrate an appreciation of the socio-economic value of livestock.

7.2.0 Content
7.2.1 Importance of livestock
7.2.2 Livestock species
  • Cattle
    - Exotic
    - Indigenous
  • Goats
  • Sheep
  • Pigs
  • Poultry (chicken)
  • Rabbits
  • Camels

Discuss each under the following:
  • Breed origin and characteristics
  • Type of each breed
  • External parts of each livestock species
  • Typical conformation

7.2.3 Terms used to describe livestock in different species by age, sex and use.

8.0.0 AGRICULTURAL ECONOMICS 1 (BASIC CONCEPTS AND FARM RECORDS) (7 Lessons)

8.1.0 Specific objectives
By the end of the topic, the learner should be able to:
  a) define economics and agricultural economics
  b) explain basic concepts of economics
c) describe the importance of agricultural economics

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d) explain the importance of farm records
e) describe the different types of farm records
f) keep farm records.

8.2.0 Content
8.2.1 Definition
• Economics
  • Agricultural Economics

8.2.2 Basic Concepts of Economics
• Scarcity
• Preferences and choice
• Opportunity cost

8.2.3 Use of farm records
8.2.4 Types of farm records
• Breeding
• Feeding
• Production
• Health
• Field operations
• Inventory
• Labour
• Marketing