

WAEC Agricultural Science Syllabus

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General Objectives

1. acquire knowledge and understanding of basic concepts in agriculture;
2. develop interest in agriculture as a business and a career;
3. acquire basic knowledge of agricultural practices and principles;
4. apply agricultural knowledge and principles to solve problems in agriculture;
5. appreciate the relationship between agriculture and other disciplines.
6. apply the knowledge of agricultural science to improve the standard of living.

1. PAPER I & 2

BASIC CONCEPTS

Content:

- MEANING AND IMPORTANCE OF AGRICULTURE
 - Definition and branches of agricultural science.
 - Types of Agriculture: subsistence and commercial.
 - Importance of agriculture: provision of food, raw materials for agro-allied industries, employment, development of rural areas, etc.
- AGRICULTURAL ECOLOGY
 - Ecological zones of West Africa.
 - Soil profile.
 - Rocks: types, characteristics, mode of formation and uses.
 - Weather and climate: elements and factors.
 - Factors affecting agricultural production: biotic and abiotic factors.
 - Soil factors: soil texture, soil structure, soil depth, soil chemistry, soil organisms.
 - Climate factors: temperature, rainfall, humidity, wind, sunlight.
 - Agricultural practices in different ecological zones.
- AGRICULTURAL ECONOMICS AND EXTENSION
 - Basic economic principles: demand and supply.
 - Production function: input/input, output/output.
 - Input/output relationships: stages of production, concepts of diminishing returns, scale of preference, and choice.
 - Characteristics of agricultural production: seasonal, biological, land-bound.

- Agricultural marketing: meaning, importance, factors affecting marketing of agricultural produce.
- Agricultural extension: meaning, importance, methods, problems in West Africa.

Learning Objectives:

1. identify the branches of agricultural science;
2. distinguish between subsistence and commercial agriculture;
3. assess the importance of agriculture to the economy;
4. classify the ecological zones of West Africa;
5. determine the relationship between soil, climate and agricultural production;
6. analyze the factors affecting agricultural production;
7. analyze the characteristics of agricultural production;
8. examine the problems of agricultural marketing in West Africa;
9. evaluate the importance of agricultural extension in West Africa.

2. AGRICULTURAL ECOLOGY

Soil

Content:

- Soil profile.
- Rocks: types, characteristics, mode of formation and uses.
- Soil formation: factors, processes.
- Soil texture, structure, depth, chemistry, organisms.
- Soil erosion: types, causes, effects, control measures.
- Soil conservation: methods and importance.
- Soil fertility: meaning, maintenance, improvement.
- Soil classification: based on texture, structure, color.
- Soil water: sources, movement, management.
- Soil pH and its importance.

Learning Objectives:

1. describe the soil profile;
2. classify different types of rocks and their uses;
3. examine the processes of soil formation;
4. analyze soil characteristics and their effects on crop production;
5. determine the causes and effects of soil erosion;
6. examine the methods of soil conservation;
7. assess soil fertility management practices;
8. classify soils based on different criteria;

9. analyze the movement and management of soil water;
10. determine the effects of soil pH on plant growth.

Climate and Weather

Content:

- Elements of weather and climate: temperature, rainfall, humidity, wind, sunlight.
- Instruments for measuring weather elements.
- Factors affecting climate.
- Effects of climate on agriculture.
- Climate change: causes, effects, and adaptation strategies.
- Weather forecasting: importance and methods.
- Micro-climate and its importance to agriculture.

Learning Objectives:

1. identify weather elements and their measurement;
2. determine the factors affecting climate;
3. analyze the effects of climate on agricultural production;
4. examine the causes and effects of climate change;
5. assess the importance of weather forecasting in agriculture;
6. analyze the importance of micro-climate to agriculture.

3. CROP PRODUCTION

Classification of Crops

Content:

- Cereals: maize, rice, guinea corn, millet.
- Pulses: cowpea, groundnut, soyabean.
- Tubers: yam, cassava, sweet potatoes.
- Vegetables and spices: tomatoes, eggplant, pepper, onion, okro, cabbage, amaranthus sp.
- Fruits: citrus, pineapple, pawpaw.
- Beverages: cocoa, kola, coffee.
- Oils: oil palm, coconut, shea butter.
- Latex: para rubber, gum arabic.
- Fibers: jute, cotton, sisal hemp.
- Sugars: sugarcane, beet.

Learning Objectives:

1. classify crops into different groups;

2. identify the economic importance of each crop group;

Crop Husbandry

Content:

- Botanical names and common names of crops.
- Varieties/types of crops.
- Climatic and soil requirements.
- Land preparation methods.
- Methods of propagation.
- Planting date, seed rate, spacing, sowing depth.
- Cultural practices: supplying, thinning, manuring and fertilizer application, weeding, pests and disease control.
- Harvesting, processing and storage of crops.

Learning Objectives:

1. apply the different methods of crop propagation, husbandry, harvesting, processing and storage for each crop;
2. identify common diseases and pests and their effects on crop yield;
3. determine the economic importance of each of the crops;
4. relate their importance to national economic development.

Pasture and Forage Crops

Content:

- Meaning of pasture and forage crops.
- Uses of forage crops.
- Types of pasture.
- Common grasses and legumes used for grazing livestock.
- Factors affecting the distribution and productivity of pasture.
- Establishment of pasture.
- Management practices of pasture.

Learning Objectives:

1. classify common grasses and legumes used as pastures and forage;
2. identify the factors affecting pasture productivity;
3. apply appropriate pasture management practices.

4. ANIMAL PRODUCTION

Animal Breeds

Content:

- Common breeds of animals and types of animals available in the locality.
- Identification of breeds.
- Methods of restraints, handling and grooming of farm animals.
- Selection of livestock and poultry for breeding.
- Culling, ear-notching, tattooing, horn or skin branding, debeaking, dehorning, castration.

Learning Objectives:

1. identify different animal breeds;
2. apply appropriate methods of animal restraint and handling;
3. determine the criteria for animal selection and culling;

Animal Nutrition

Content:

- Animal feeds and feed stuffs and their local sources.
- Types of feeds: concentrates, roughages, supplements.
- Nutrient requirements of farm animals.
- Feed formulation.
- Deficiency symptoms and remedies.
- Feed processing and preservation.

Learning Objectives:

1. classify different types of animal feeds;
2. determine nutrient requirements for different animal categories;
3. apply feed formulation techniques;
4. identify deficiency symptoms and their remedies.

Animal Health

Content:

- Main pests and parasites of farm animals.
- Diseases of farm animals: causal organisms, symptoms, prevention and control.
- Vaccination and immunization.
- Sanitation and hygiene in animal production.
- Quarantine procedures.

Learning Objectives:

1. identify common pests and diseases of livestock;

2. apply appropriate disease prevention and control measures;
3. examine the importance of vaccination and immunization;
4. apply proper sanitation practices in animal production.

Fishery and Aquaculture

Content:

- Fish culture systems: extensive, semi-intensive, intensive.
- Common types of fishes: Tilapia, Catfish, etc.
- Fish harvesting and processing methods.
- Fishery regulations.
- Wildlife management: habitat conservation, feeding, domestication, harvesting, processing and wildlife regulations.

Learning Objectives:

1. classify different fish culture systems;
2. identify common fish species and their characteristics;
3. apply appropriate fish harvesting and processing techniques;
4. examine fishery regulations and their importance.

5. AGRICULTURAL ENGINEERING/MECHANIZATION

Farm Tools and Equipment

Content:

- Types of farm tools and equipment.
- Uses and maintenance of farm tools and equipment.
- Simple farm tools: cutlass, hoe, spade, etc.
- Tractor and tractor-coupled implements.
- Harvesting, processing and storage equipment.
- Livestock and fishing equipment.
- Farm surveying equipment.

Learning Objectives:

1. identify different types of farm tools and equipment;
2. apply proper maintenance procedures for farm tools and equipment;
3. distinguish between different types of farm machinery and their uses.
4. use farm surveying equipment correctly.

Farm Power

Content:

- Sources of farm power: human, animal, mechanical.
- Advantages and disadvantages of different power sources.
- Limitations of agricultural mechanization.
- Prospects of agricultural mechanization in West Africa.

Learning Objectives:

1. identify different sources of farm power;
2. analyze the advantages and disadvantages of different power sources;
3. examine the limitations and prospects of agricultural mechanization in West Africa.

6. AGRICULTURAL ECONOMICS AND MARKETING

Agricultural Economics

Content:

- Basic economic principles: demand and supply.
- Production function: input/input, output/output.
- Input/output relationships: stages of production, concepts of diminishing returns, scale of preference, and choice.
- Characteristics of agricultural production: seasonal, biological, land-bound.
- Cost concepts: fixed cost, variable cost, total cost, marginal cost.
- Profit and loss analysis.

Learning Objectives:

1. apply basic economic principles to agricultural production;
2. analyze production functions and input/output relationships;
3. determine the costs and revenues associated with agricultural production;
4. compute profit and loss in agricultural enterprises.

Agricultural Marketing

Content:

- Meaning and importance of marketing of agricultural produce.
- Marketing agents and their functions.
- Marketing functions: assembling, transportation, processing, etc.
- Marketing of export crops.
- Export crops in West Africa.
- Guidelines for exporting crops in West Africa.

- Corporate bodies, cooperative societies and individuals engaged in exporting agricultural produce.
- Problems of marketing agricultural produce.

Learning Objectives:

1. examine the importance of marketing in agriculture;
2. identify the different marketing agents and their functions;
3. analyze the marketing functions for agricultural produce;
4. evaluate the problems of marketing agricultural produce.
5. assess the importance of export crop marketing.

7. AGRICULTURAL EXTENSION

Agricultural Extension

Content:

- Meaning and importance of agricultural extension.
- Agricultural extension methods: individual contact methods, group contact methods.
- The role of agricultural development programmes, universities, research institutes, and farmers' organizations (Cooperative societies).
- Extension methods including demonstration plots, use of visual aids, mass media, etc.
- Problems of agricultural extension in West Africa and possible solutions.

Learning Objectives:

1. examine the importance of agricultural extension;
2. analyze different extension methods and their applications;
3. assess the role of various institutions in agricultural extension;
4. examine the problems of agricultural extension in West Africa;
5. provide possible solutions to the problems of agricultural extension.

8. AGRICULTURAL INSURANCE

Agricultural Insurance

Content:

- Meaning of agricultural insurance.
- Importance of agricultural insurance.
- Types of insurance policies for agricultural production: specific enterprise insurance (crop insurance, livestock insurance), farm vehicle insurance, fire disaster insurance, life assurance.
- Insurance premium.
- Problems of agricultural insurance: uncertainties of weather, losses due to natural disaster, etc.

Learning Objectives:

1. define agricultural insurance;
2. assess the importance of agricultural insurance;
3. classify different types of agricultural insurance policies;
4. examine the problems associated with agricultural insurance.

Recommended Textbooks

1. Adeniyi, M. O. et al (1999) Countdown to Senior Secondary Certificate Examination Agricultural Science, Ibadan: Evans.
2. Akinsanmi, O. A. (2000) Senior Secondary Agricultural Science, UK: Longman.
3. Antonio, Q. B. O. (1999) General Agriculture for West Africa, London: George Allen
4. Are, L. A. et al (2010) Comprehensive Certificate Agricultural Science for Senior Secondary School, University Press Plc.
5. Egbuna, C. K. et al (2014) Extension Modern Agricultural Science for Senior Secondary Schools (2010), Extension Publication.
6. Emmanuel C. A. (2003) A Dictionary of Agriculture, Benue: Agitab Publisher Makurdi.
7. Falusi, A. O. and Adeleye, I. O. A (2000) Agricultural Science for Junior Secondary Schools Books 1-3, Ibadan: Onibonoje.
8. Komolafe, M. F., Adegbola, A. A., Are, L. A. and Ashaye, T. I. (2004) Agricultural Science for Senior Secondary Schools 1, 2 and 3, Ibadan: University Press Ltd.
9. Philips T. A. (1986) Agricultural Notebook, Lagos: Longman
10. STAN (1999) Agricultural Science for Senior Secondary Schools, Lagos: Longman