



## **LANDMARK UNIVERSITY, OMU-ARAN**

### **CRP 322 COURSE COMPACT**

**COLLEGE:** AGRICULTURAL SCIENCES  
**DEPARTMENT:** CROP AND SOIL SCIENCE  
**PROGRAMME:** B. AGRICULTURE  
**COURSE COMPACT FOR:** CRP 322

#### **COURSE**

**COURSE CODE:** CRP 322  
**COURSE TITLE:** PRODUCTION OF PERMANENT CROPS  
**CREDIT UNIT:** 2 UNITS  
**COURSE STATUS:** COMPULSORY

#### **LECTURER'S DATA**

**NAME OF THE LECTURER:** PROF. G. O. AGBAJE  
**QUALIFICATIONS OBTAINED:** B. AGRIC, M.SC AND PH.D(CROP PRODUCTION AND PHYSIOLOGY)  
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**CONSULTATION HOURS:** TUESDAYS 1-3  
THURSDAYS 1-3

**NAME OF THE LECTURER:** DR. C. M. ABOYEJI  
**QUALIFICATIONS OBTAINED:** B.AGRIC. (ILORIN); M.SC. AGRONOMY (ZARIA); MBA. (LAUTECH); PGDE (ZARIA), PH.D. AGRONOMY (ILORIN)

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**OFFICE LOCATION:** B008

**CONSULTATION HOURS:** MONDAYS 2-4  
TUESDAYS 1-3  
THURSDAYS 1-3

### **INTRODUCTION TO THE COURSE**

#### **COURSE DESCRIPTION**

EMPHASIS WOULD BE BASED ON THE GENERAL PRINCIPLES OF TREE CROP PRODUCTION AND THE ENVIRONMENTAL FACTORS E.G SOIL/EDAPHIC AND CLIMATIC REQUIREMENTS RESPONSIBLE FOR OR MILITATING AGAINST THEIR LARGE SCALE PRODUCTION. IN ADDITION, DIFFERENT PESTS AND DISEASES WHICH CONSTITUTE THREAT TO PRODUCTION EFFORTS AND HOW THOSE PESTS AND DISEASES COULD BE CONTROLLED WOULD BE DISCUSSED.

#### **COURSE JUSTIFICATION**

THE COURSE WILL INTRODUCE STUDENTS TO HOW PERMANENT CROPS CAN BE RAISED FROM SEEDS TO SEEDLINGS AND WHEN THE CROPS WILL BE MOVED FROM THE NURSERY BED TO THE FIELD. DIFFERENCE BETWEEN SEEDS, SEEDLINGS, CUTTINGS, SUCKERS E.T.C WILL ALSO BE DISCUSSED. THE ECONOMIC IMPORTANCE OF EACH PERMANENT TREE CROP AND HOW IT SUSTAIN THE FARMERS AND INCREASE THE GROSS DOMESTIC PRODUCT OF THE NATION WOULD ALSO BE HIGHLIGHTED.

#### **COURSE OBJECTIVES**

AT THE END OF THIS COURSE, STUDENTS WOULD BE ABLE TO:

- I. IDENTIFY DIFFERENT TREE CROPS THAT ARE ECONOMICAL
- II. ESTABLISH AND MAINTAIN SMALL HECTARE OF ANY TREE CROP STUDIED.
- III. IDENTIFY SOIL AND CLIMATIC REQUIREMENTS OF EACH TREE/PERMANENT CROP
- IV. IDENTIFY DISEASE AND CONTROL MEASURES OF EACH TREE/PERMANENT CROP
- V. KNOW DIFFERENT STORAGE METHODS FOR THE PRODUCE OF EACH OF THE TREE/PERMANENT CROPS.
- VI. KNOW THE PROCESSING AND USES OF PRODUCE DERIVED EACH TREE/PERMANENT CROP

## **COURSE CONTENT**

ESTABLISHMENT, MANAGEMENT, PROCESSING, STORAGE, UTILIZATION AND IMPROVEMENT OF TREE AND PLANTATION CROPS SUCH AS COCOA, KOLA, OIL PALM, RUBBER, COFFEE, CITRUS, COCONUT, CASHEW, BANANA AND PINEAPPLES.

## **COURSE REQUIREMENT**

FOR BETTER UNDERSTANDING OF THE COURSE, STUDENTS ARE REQUIRED TO HAVE PRIOR UNDERSTANDING OF CROP PRODUCTION, SOIL NUTRIENTS AND MINERAL NUTRITION, ORGANIC AND IN-ORGANIC FERTILIZERS, NUTRIENTS MANagements, SOIL STRUCTURE AND TEXTURE.

## **COURSE EXPECTATIONS:**

### **METHOD OF GRADING**

<b>S/N</b>	<b>GRADING</b>	<b>SCORE(%)</b>
<b>1.</b>	<b>CONTINUOUS ASSESSMENTS</b>	
	• C.A I	<b>7%</b>
	• C.A II (MID-SEMESTER TEST)	<b>15%</b>
	• C.A III	<b>8%</b>
<b>2.</b>	<b>ASSIGNMENT</b>	
<b>3.</b>	<b>PRACTICAL (LABORATORY WORK)/ CASE STUDIES</b>	<b>10%</b>
<b>4.</b>	<b>FINAL EXAMINATION</b>	<b>60%</b>
<b>5.</b>	<b>TOTAL</b>	<b>100</b>

## **COURSE DELIVERY STRATEGIES**

LECTURING METHOD THROUGH POWER POINT PRESENTATIONS WHICH WILL BE COMPLIMENTED WITH FIELD WORK WILL BE ADOPTED. DIFFERENT TYPES OF PERMANENT CROPS WILL ALSO BE SHOWN TO THE STUDENTS. PRACTICAL ILLUSTRATIONS WILL ALSO BE USED WHERE APPLICABLE. VISITS TO RELEVANT COURSE – RELATED PLACES LIKE THE FRUIT NURSERY, VEGETABLE NURSERY OF THE UNIVERSITY AND THE NURSERY ESTABLISHED BY THE PPD OF THE UNIVERSITY, IDENTIFICATION, USES AND MAINTENANCE OF TOOLS USED FOR TREE CROP PRODUCTION. IDENTIFICATION OF THE SEEDS OF SAMPLES OF TREE CROPS

## **COURSE DURATION:**

### **LECTURE CONTENT**

#### **MODULE 1 (WEEKS 1-7)**

**WEEK 1: TOPIC FOR THE WEEK: INTRODUCTION TO THE PRODUCTION OF PERMANENT TREE CROPS**

**OBJECTIVES: AT THE END OF THE LECTURE, STUDENT SHOULD BE ABLE TO:**

- ✓ KNOW THE DIFFERENCE BETWEEN PERMANENT AND TEMPORARY CROPS
- ✓ KNOW WHY WE HAVE TO STUDY PERMANENT TREE CROPS,
- ✓ ENUMERATE AND DESCRIBE SOME TERMINOLOGIES IN THE PRODUCTION OF PERMANENT TREE CROPS
  - PRE-NURSERY
  - NURSERY
  - HOLING
  - BEATING UP
  - TRANSPLANTING
  - BLOCKING
  - FIRE TRACING
  - RUB OUT E.T.C.
- ✓ DESCRIBE BASIC PRINCIPLES IN THE SELECTION OF SEEDS, CARE OF SEEDS, PLANTING OF SEEDS; GROWING OF SEEDLINGS, AND CARE FOR SEEDLINGS AT THE PRE-NURSERY, NURSERY AND THE FIELD LEVELS
- ✓ DESCRIBE NURSERY ACTIVITIES AND OPERATIONS,
- ✓ KNOW NURSERY EQUIPMENTS E.G DIGGING FORK, RAKE, HOE, WATERING CAN, CUTLASS, SPADE, SHOVEL, WHEEL BARROW, KNIFE AND NURSERY MATERIALS E.G POLY BAGS,

- ✓ FERTILIZER, INSECTICIDES, HERBICIDES E.T.C
- ✓ KNOW THE BEST SITE AND BE ABLE TO DESIGN A NURSERY BED,
- ✓ DESCRIBE THE MANAGEMENT OPERATIONS THAT ARE CRITICAL IN THE PRODUCTION OF PERMANENT CROP SEEDLINGS—WEEDS, PESTS AND DISEASE, WATER AND SOIL NUTRIENT.
- ✓ DESCRIBE MAJOR FIELD OPERATIONS IN PERMANENT CROP PRODUCTION-- WEEDS, PESTS AND DISEASE MANAGEMENT, WATER AND SOIL NUTRIENT MANAGEMENT, HARVESTING, PROCESSING AND STORAGE.

#### **DESCRIPTION**

**FIRST HOUR:** PERMANENT AND TEMPORARY CROPS AND TERMINOLOGIES IN THE PRODUCTION OF PERMANENT TREE CROPS

**SECOND HOUR:** NURSERY OPERATIONS, NURSERY EQUIPMENTS AND NURSERY MANagements.

#### ➤ **STUDY QUESTION:**

- DESCRIBE NURSERY ACTIVITIES AND OPERATIONS?
- WHY NURSERY OPERATION?
- MENTION FIVE EACH OF NURSERY EQUIPMENTS AND NURSERY MATERIALS
- LIST AND DESCRIBE FIVE TERMINOLOGIES USED IN THE PRODUCTION OF PERMANENT TREE CROPS

#### **READING LIST –**

APPLETON, BONNIE L. AND SUSAN C. FRENCH. (2000). WEED SUPPRESSION FOR CONTAINER-GROWN WILLOW USING COPPER-TREATED FABRIC DISKS. HORTTECHNOLOGY. JANUARY-MARCH. P. 204-206.

ARENT, GALE L. (1996). THE GREENHOUSE WASTESTREAM. HORTTECHNOLOGY. OCTOBER-DECEMBER P. 365-366.

BIDDINGER, ERIC, DAVE BEATTIE, AND ROBERT BERGHAGE. (1999). THE EFFECTS OF COPPER TREATED FIBRE CONTAINERS ON THE GROWTH OF FOUR COMMERCIAL PLANT SPECIES. GREENHOUSE PRODUCT NEWS. OCTOBER. P. 22, 24-27.

#### **WEEK 2**

**TOPIC:** PRODUCTION OF COCOA

**GENUS:** THEOBROMA.

**SPECIES:** CACAO

**BINOMIAL NAME:** *THEOBROMA CACAO* LINEUS (L)

**OBJECTIVES:** - AT THE END OF THE LECTURE, STUDENT SHOULD BE ABLE TO:

- ✓ IDENTIFY A CACAO TREE.
- ✓ KNOW BOTH THE CLIMATIC, SOIL AND NUTRITIONAL REQUIREMENT OF COCOA TREE,
- ✓ DESCRIBE ALL OPERATIONS PERFORMED AT BOTH THE NURSERY AND FIELD LEVEL,
- ✓ KNOW SOME PEST AND DISEASES THAT ARE PREVALENT IN COCOA PLANTATION AND HOW THEY CAN BE CONTROLLED.
- ✓ DESCRIBE FERMENTATION PROCESSES.
- ✓ DESCRIBE THE GRADING PROCESS AND KNOW THE STORAGE METHODS FOR THE DRIED COCOA BEANS.
- ✓ LIST SOME OF THE PRODUCTS THAT CAN BE DERIVED from cocoa.

#### ➤ **DESCRIPTION**

##### **FIRST HOUR:**

- I. ORIGIN, CLIMATIC, SOIL AND NUTRITIONAL REQUIREMENT OF COCOA TREE
- II. NURSERY AND FIELD OPERATIONS IN COCOA BEANS PRODUCTION
- III. MANAGEMENT OF COCOA TREE

##### **SECOND HOUR:**

- I. HARVESTING, PROCESSING, GRADING, STORAGE AND USES OF COCOA BEANS
- II. ITS IMPORTANCE IN THE NIGERIA ECONOMY

➤ **STUDY QUESTION:**

- WHY DO WE HAVE TO FERMENT COCOA BEANS?
- WHAT TYPE OF MATERIALS CAN WE USE TO BAG DRY COCOA BEANS?
- WHY IS SHADE MANAGEMENT IMPORTANT IN COCOA NURSERY?
- IDENTIFY THE MAJOR NURSERY OPERATIONS IN RAISING COCOA SEEDLINGS?

**READING LIST –**

ADOMAKO, D., (1995). “NON-TRADITIONAL USES OF COCOA IN GHANA”. EIGHTH MEETING OF THE ADVISORY GROUP ON THE WORLD COCOA ECONOMY, 26TH-30TH JUNE 1995, YAOUNDE, CAMEROON, PP.79-85. ICCO, ADU-AMPOMAH Y., NOVAK

F., AFZA R. AND VAN DURREN M. (1987). “EMBROID AND PLANT PRODUCTION FROM CULTURED COCOA EXPLANTS”. PROCEEDINGS OF THE TENTH INTERNATIONAL COCOA RESEARCH CONFERENCE, SANTO DOMINGO, MAY, PP129-136

AMOAH, J.E.K. (1995). DEVELOPMENT OF CONSUMPTION, COMMERCIAL PRODUCTION AND MARKETING. JEMRE ENTERPRISES,

BECKETT S.T.,(1994). INDUSTRIAL CHOCOLATE MANUFACTURE AND USE. SECOND EDITION. BLACKIE ACADEMIC & PROFESSIONAL,

BISCUIT,CAKE, CHOCOLATE AND CONFECTIONERY ALLIANCE (BCCCA), (1996).COCOA BEANS. CHOCOLATE MANUFACTURERS QUALITY REQUIREMENTS.

**WEEK 3**

**TOPIC:** PRODUCTION OF KOLA NUT

**GENUS:** - KOLA

**SPECIE:** - K.VERA

**BINOMIAL NAME:** - KOLA VERA

**OBJECTIVES:** - AT THE END OF THE LECTURE STUDENTS SHOULD BE ABLE TO: -

- IDENTIFY A KOLA NUT TREE,
- KNOW THE ORIGIN OF THE CROP,
- KNOW THE CLIMATIC AND SOIL REQUIREMENT FOR THE CROP
- IDENTIFY LAND TYPE AND VEGETATION
- ESTABLISH NURSERY BED FOR RAISING KOLA AND THE NURSERY REQUIREMENT,
- KNOW THE REQUIREMENTS FOR FIELD ESTABLISHMENT
- DIFFERENTIATE BETWEEN NURSERY AND FIELD MANAGEMENT
  - CROPPING SYSTEMS
  - WEEDING
  - FERTILIZER APPLICATION AND SPACING
  - VARIETIES
  - PESTS AND DISEASES AND THEIR CONTROL
  - HARVESTING
- PROCESSING,
- STORAGE,
- UTILISATION.

**DESCRIPTION**

**FIRST HOUR:**

- I. IDENTIFICATION, ORIGIN, CLIMATIC, SOIL AND NUTRITIONAL REQUIREMENT OF KOLA NUT
- II. NURSERY REQUIREMENT AND FIELD ESTABLISHMENT

**SECOND HOUR:**

- I. FIELD MANAGEMENT, PROCESSING, STORAGE AND UTILISATION.
- II. ITS IMPORTANCE IN THE NIGERIA ECONOMY

➤ **STUDY QUESTION:**

- IN A TABULAR FORM, DIFFERENTIATE BETWEEN KOLA NITIDA AND KOLA ACUMINATA
- MENTION TWO PARASITIC WEEDS/EPIPHYTES THAT ATTACK KOLA NUT TREE

➤ LIST FIVE TYPES OF PEST FOUND ON KOLA NUT TREE

**READING LIST –**

FAO (1982). FRUIT BEARING FOREST TREES. TECHNICAL NOTES. FAO FORESTRY PAPER NUMBER 34, PP. 43-45. FAO, ROME.

OPEKE, L. K. (1992). "TROPICAL TREE CROPS," SPECTRUM BOOKS LTD., IBADAN.

OYEDADE, T. (1973). SOME ASPECT OF DEVELOPMENTAL PHYSIOLOGY OF THE NIGERIAN KOLA (COLA NITIDA) FRUIT. ECONOMIC BOTANY 27, 417-422.

PURSEGLOVE, J. W. (1968). "TROPICAL CROPS: DICOTYLEDONS," LONGMANS GREEN & CO LTD, LONDON.

ROSENGARTEN, F. (1984). "THE BOOK OF EDIBLE NUTS," WALKER AND COMPANY, NEW YORK.

RUSSELL, T. A. (1955). THE KOLA OF NIGERIA AND THE CAMEROONS. TROPICAL AGRICULTURE, TRINIDAD 32, 210-240.

SANWO, J. O. (1998). YIELD PATTERNS OF COLA NITIDA (VENT) SCHOTT AND ENDL. IN THE HUMID TROPICS. 1. PRELIMINARY OBSERVATIONS ON SOME YIELD COMPONENTS. NIGERIAN JOURNAL OF TREE CROP RESEARCH 2, 17-29.

**WEEK 4**

**TOPIC: OIL PALM PRODUCTION**

**GENUS: - ELAEIS**

**SPECIE: - GUINEENSIS**

**BINOMIAL NAME: - *ELAEIS GUINEENSIS* JACQUIN**

**OBJECTIVES: - AT THE END OF THE LECTURE, STUDENT SHOULD BE ABLE TO:**

- ENUMERATE THE BOTANICAL CHARACTERISTICS OF OIL PALM
- KNOW THE ORIGIN OF THE CROP
- HOW THE CROP IS BEEN ESTABLISHED, ITS AGRONOMY,
- KNOW THE CLIMATIC AND SOIL REQUIREMENTS FOR OIL PALM,
- ENUMERATE THE DIFFERENT TYPES OF PALMS THAT EXIST IN THEIR ENVIRONMENT
- IDENTIFY AND DESCRIBE NURSERY AND FIELD MANAGEMENT OPERATIONS
- IDENTIFY SOME PESTS AND DISEASES THAT AFFECT THE CROP
- PROCESSING AND UTILIZATION OF THE FRUITS,
- STORAGE AND ECONOMIC VALUE OF THE FRUITS.

➤ **DESCRIPTION**

**FIRST HOUR:**

- I. IDENTIFICATION, ORIGIN, CLIMATIC, SOIL AND NUTRITIONAL REQUIREMENT OF KOLA NUT
- II. NURSERY REQUIREMENT AND FIELD ESTABLISHMENT

**SECOND HOUR:**

- I. PROCESSING, UTILIZATION, STORAGE AND ECONOMIC VALUE OF THE FRUITS.
- II. ITS IMPORTANCE IN THE NIGERIA ECONOMY

➤ **STUDY QUESTION:**

1. DESCRIBE THE STAGE AT WHICH YOU CAN EASILY TRANSFER SEEDLINGS TO THE PERMANENT SITE.
2. WHAT ARE THE ADVANTAGES OF POLY BAGS IN OIL PALM NURSERY OPERATIONS?
3. LIST FIVE AGRONOMIC MANAGEMENT PRACTICES EMPLOYED IN OIL PALM PLANTATION

**READING LIST –**

OPEKE, L. K. (1992). "TROPICAL TREE CROPS," SPECTRUM BOOKS LTD., IBADAN.

HOJGAARD, A., JOHANSEN, J., & ODUM, S. (1989). A CENTURY OF TREE PLANTING ON THE FAROE ISLANDS.

ANN. SOC. SCI. FAEROENSIS SUPPLEMENTUM 14. HORNSTRA, 1990 'EFFECTS OF DIETARY LIPIDS ON SOME ASPECTS OF THE CARDIOVASCULAR RISK PROFILE'. IN G. ZIANT [ED.], LIPIDS AND HEALTH.

VAN DER VOSSEN. 1969. AREAS CLIMATICALLY SUITABLE FOR OPTIMAL OIL PALM PRODUCTION IN THE FOREST ZONE OF GHANA. GHANA JOURNAL OF AGRICULTURAL SCIENCE. 2 (2) PP. 113-118.

TAY, J.H. 1990. COMPLETE RECLAMATION OF OIL PALM WASTES. RESOURCES, CONSERVATION, AND RECYCLING, 5 (4) P. 383-392.

THOMAS, PETER. 2000 TREES: THEIR NATURAL HISTORY. CAMBRIDGE UNIVERSITY PRESS.

## **WEEK 5**

**TOPIC: REVISION AND TEST**

**OBJECTIVES:** TO PROVIDE TIME FOR STUDENTS TO HAVE SELF STUDY ON WHAT THEY HAVE BEEN TAUGHT AND ASK QUESTIONS ON TOPICS WHERE THERE IS DOUBT FOR CLARIFICATION AND ALSO TO ASSESS THEIR UNDERSTANDING ON THE FOLLOWING TOPICS:

- DIFFERENCE BETWEEN PERMANENT AND TEMPORARY CROPS
- TERMINOLOGIES USED IN THE PRODUCTION OF PERMANENT CROPS
- PREPARATION OF NURSERY BEDS FOR DIFFERENT PERMANENT CROPS
- ECOLOGY AND CLIMATIC REQUIREMENT FOR PERMANENT CROPS STUDIED
- AGRONOMIC REQUIREMENT FOR ALL THE PERMANENT CROPS STUDIED
- PROCESSING AND UTILISATION OF ALL THE PERMANENT CROPS STUDIED

## **WEEK 6**

**TOPIC: CASHEW PRODUCTION**

**OBJECTIVES:** - AT THE END OF THE LECTURE, STUDENT SHOULD BE ABLE TO:

- IDENTIFY AND DESCRIBE CASHEW AS A CROP.
- KNOW THE ORIGIN OF CASHEW TREE
- THE CLIMATIC AND SOIL REQUIREMENT
- ENUMERATE THE AGRONOMIC REQUIREMENTS FOR CASHEW CULTIVATION.
  - LAND PREPARATION
  - TRANSPLANTING
  - WEEDING
  - FERTILIZER APPLICATION E.T.C.
- DESCRIBE NURSERY AND FIELD OPERATIONS IN THE MANAGEMENT OF CASHEW
- PRODUCTION
- KNOW DIFFERENT VARIETIES OF CASHEW GROWN ESPECIALLY IN AFRICA
- DESCRIBE THE HARVESTING, PROCESSING AND STORAGE OF CASHEW NUTS AND FRUITS.
- PESTS AND DISEASES ASSOCIATED WITH CASHEW TREE, FRUITS AND NUTS
- ENUMERATE SOME OF THE USES OF CASHEW FRUITS, NUTS AND TREE.

### ➤ **DESCRIPTION**

#### **FIRST HOUR:**

- I. IDENTIFICATION, ORIGIN, CLIMATIC, SOIL AND NUTRITIONAL REQUIREMENT OF CASHEW
- II. NURSERY REQUIREMENT AND FIELD ESTABLISHMENT

#### **SECOND HOUR:**

- I. PROCESSING, UTILIZATION, STORAGE AND ECONOMIC VALUE OF THE FRUITS.
- II. ITS IMPORTANCE IN THE NIGERIA ECONOMY

#### **STUDY QUESTION:**

1. DESCRIBE THE NURSERY OPERATIONS REQUIRED IN CASHEW CULTIVATION.
2. DESCRIBE SOME OF THE FIELD OPERATIONS IN THE AREA OF PESTS AND DISEASES  
MANAGEMENT IN CASHEW PLANTATION.

### 3. DISCUSS THE PROCESSING OF CASHEW NUTS AND FRUITS.

#### READING LIST -

Azam-Ali, S.H. and E.C. Judge. 2001. Small-scale cashew nut processing. FAO, Rome.

Bhaskara Rao, E.V.V. and H.H. Khan (eds). 1984. Cashew research and development.

Indian Soc. Plantation Crops, Kerala, India. Duke, J.A. 2001. Handbook of nuts. CRC Press, Boca Raton, FL.

Thomas, Peter. 2000 Trees: Their Natural History. Cambridge University Press.

#### WEEK 7

**TOPIC: PRODUCTION OF RUBBER TREE**

**GENUS: - HEVEA**

**SPECIE: - BRASILLENIS**

**BINOMIAL NAME: - HEVEA BRASILLENIS**

**OBJECTIVES: - AT THE END OF THE LECTURE, STUDENT SHOULD BE ABLE TO:**

- IDENTIFY AND DESCRIBE A RUBBER PLANT,
- ENUMERATE THE DIFFERENT CLONES AVAILABLE IN NIGERIA,
- DESCRIBE THE NURSERY OPERATIONS IN RUBBER CULTIVATION,
- DESCRIBE FIELD OPERATIONS IN MAINTENANCE OF RUBBER PLANTATION,
- ENUMERATE THE TOOLS USED IN TAPPING RUBBER LATEX,
- DESCRIBE THE PROCESS OF TAPPING AND THE PROCESSING OF LATEX
- ENUMERATE THE USES OF RUBBER

➤ **DESCRIPTION**

**FIRST HOUR:**

- III. IDENTIFICATION, ORIGIN, CLIMATIC, SOIL AND NUTRITIONAL REQUIREMENT OF RUBBER TREE
- IV. NURSERY REQUIREMENT AND FIELD ESTABLISHMENT

**SECOND HOUR:**

- I. METHODS OF TAPPING AND THE PROCESSING OF LATEX
- II. USES OF RUBBER LATEX
- III. ITS IMPORTANCE IN THE NIGERIA ECONOMY

➤ **STUDY QUESTION:**

- 1 What are the different types of nursery operations in rubber?
- 2. Discuss in details budding in rubber.
- 3. Identify the cover crops often planted in rubber plantations.

#### READING LIST -

India, Ministry of Commerce and Industry. 'Rubber Cultivation' Rubber Board

Bowers, J.E. (1990) Natural Rubber-Producing Plants for the United States. Beltsville, MD. National Agricultural Library.

#### MODULE 2 (WEEKS 8-14)

##### WEEK 8

**TOPIC: PRODUCTION OF BANANA AND PLANTAIN**

**GENUS: - MUSA**

**SPECIE: - SPP**

**BINOMIAL NAME: - MUSA SPP.**

**OBJECTIVES: AT THE END OF THE LECTURE, STUDENT SHOULD BE ABLE TO:**

- IDENTIFY A BANANA AND PLANTAIN PLANT,
- DISTINGUISH BETWEEN THE DIFFERENT TYPES OF CULTIVARS OF THE MUSA SPP.
- DISCUSS THE CULTIVATION OF BANANAS AND PLANTAIN,

- DIFFERENTIATE BETWEEN BANANA AND PLANTAIN,
- IDENTIFY STEPS TO COMBAT AND CONTROL DISEASES IN BANANA AND PLANTAIN PLANTATIONS,
- IDENTIFY SOME OF THE USES OF BANANA AND PLANTAIN,
- DISCUSS BANANA TRADE,
- IDENTIFY SOME SCIENTIFIC TECHNOLOGIES IN THE IMPROVEMENT OF BANANA CULTIVARS

➤ **DESCRIPTION**

**FIRST HOUR:**

- I. IDENTIFICATION, ORIGIN, CLIMATIC, SOIL AND NUTRITIONAL REQUIREMENT OF BANANA AND PLANTAIN
- II. NURSERY REQUIREMENT AND FIELD ESTABLISHMENT
- III. DIFFERENTIATE BETWEEN BANANA AND PLANTAIN

**SECOND HOUR:**

- I. PLANTING MATERIALS FOR BANANA AND PLANTAIN
- II. FIELD MANAGEMENT OF BANANA AND PLANTAIN
- III. PROCESSING AND USES
- IV. ITS IMPORTANCE IN THE NIGERIA ECONOMY

➤ **STUDY QUESTION:**

1. WHAT IS THE DIFFERENCE BETWEEN BANANA AND PLANTAIN?
2. DESCRIBE THE FIELD MAINTENANCE OPERATIONS IN BANANA/PLANTAIN PLANTATION.
3. DISCUSS THE AGRONOMIC PRACTICES INVOLVED IN THE PRODUCTION OF BANANA AND PLANTAIN

**READING LIST –**

DENHAM, T., HABERLE, S. G., LENTFER, C., FULLAGAR, R., FIELD, J., PORCH, N., THERIN, M., WINSBOROUGH B., AND GOLSON, J. MULTI-DISCIPLINARY EVIDENCE FOR THE ORIGINS OF AGRICULTURE FROM 6950-6440 CAL BP AT KUK SWAMP IN THE HIGHLANDS OF NEW GUINEA. SCIENCE, JUNE 2003 ISSUE.

EDITORS (2006). "BANANA FIBER RUGS". DWELL 6 (7): 44.

BRIEF MENTION OF BANANA FIBRE RUGS FAO. BANANAS COMMODITY NOTES: FINAL RESULTS OF THE 2003 SEASON, 2004.

MWANGI, M.; BANDYOPADHYAY, R.; RAGAMA, P. & TUSHEMEREIRWE, R.K. (2007). "ASSESSMENT OF BANANA PLANTING PRACTICES AND CULTIVAR TOLERANCE IN RELATION TO MANAGEMENT OF SOILBORNE *XANTHOMONAS CAMPESTRIS* PV. *MUSACEARUM*". *CROP PROTECTION* 26 (8): 1203–1208. [DOI:10.1016/J.CROPRO.2006.10.017](https://doi.org/10.1016/j.cropro.2006.10.017)

SCOTT, K.J. & GANDANEGARA, S. (1974). "EFFECT OF TEMPERATURE ON THE STORAGE LIFE OF BANANAS HELD IN POLYETHYLENE BAGS WITH AN ETHYLENE ABSORBENT". *TROPICAL AGRICULTURE (TRINIDAD)* 51: 23–26

**WEEK 9**

**TOPIC:** PRODUCTION OF COFFEE TREES

**GENUS:** - COFFEA L.

**SPECIES:** - ARABICA, CANEPHORA

**OBJECTIVES:** AT THE END OF THE LECTURE, STUDENT SHOULD BE ABLE TO:

- DISTINGUISH COFFEE TREE FROM OTHER TREES
- IDENTIFY THE DIFFERENT SPECIES OF COFFEE
- DESCRIBE THE AGRO-CLIMATIC AND EDAPHIC REQUIREMENTS FOR THE CULTIVATION AND PRODUCTION OF COFFEE.
- EXPLAIN THE MAINTENANCE CULTURE INVOLVED IN COFFEE PLANTATION
- LIST THE AVAILABLE VARIETIES OF COFFEE
- DESCRIBE THE NURSERY AND FIELD MANAGEMENT OPERATIONS NECESSARY FOR THE CULTIVATION OF COFFEE.
- DESCRIBE THE HARVESTING AND PROCESSING OF COFFEE BEANS

➤ IDENTIFY THE USES OF COFFEE.

➤ **DESCRIPTION**

**FIRST HOUR:**

- I. AGRO-CLIMATIC AND EDAPHIC REQUIREMENTS FOR THE CULTIVATION AND PRODUCTION OF COFFEE.
- II. AGRONOMIC/MANAGEMENT PRACTICES PRODUCTION OF COFFEE.

**SECOND HOUR:**

- I. VARIETIES OF COFFEE
- II. HARVESTING, PROCESSING AND USES OF COFFEE BEANS

**STUDY QUESTION:**

1. DISCUSS THE IMPORTANCE OF NURSERY OPERATIONS IN COFFEE PROPAGATION?
2. WHAT ARE THE MAJOR COFFEE DISEASES AT THE NURSERY STAGE?
3. DIFFERENTIATE BETWEEN THE TWO VARIETIES OF COFFEE
4. WHY ARE PESTS AND DISEASES CONTROL VERY IMPORTANT IN COFFEE PLANTATION MAINTENANCE?
5. DISCUSS THE STORAGE METHODS FOR COFFEE

**READING LIST -**

*BUNKER, M. L.; McWILLIAMS, M. (JANUARY 1979). "CAFFEINE CONTENT OF COMMON BEVERAGES". J. AM. DIET. ASSOC. 74: 28-32.*

*COFFEE: A GUIDE TO BUYING BREWING AND ENJOYING, 5TH EDITION, BY KENNETH DAVIDS*

*BAKER, P. S. (2004). SUSTAINABLE COFFEE: THE THREE PILLARS OF WISDOM. F. O. LICHT'S INTERNATIONAL COFFEE FORUM 2004. CABI COMMODITIES, CABI BIOSCIENCE, EGHAM, UK.*

*BAKER, P. S., MURPHY, S. AND DAY, R. (2001). BIOLOGICAL CONTROL OF THE COFFEE BERRY BORER. IN PROCEEDINGS OF THE 19<sup>TH</sup> INTERNATIONAL SCIENTIFIC COLLOQUIUM ON COFFEE, 14-18 MAY 2001, TRIESTE, ITALY. ASIC, PARIS, FRANCE. CD-ROM.*

*BARDNER, R. (1985). PEST CONTROL. IN COFFEE: BOTANY, BIOCHEMISTRY AND PRODUCTION OF BEANS AND BEVERAGE, 208-218 (Eds M. N. CLIFFORD AND K. C. WILLSON). LONDON: CROOM HELM.*

*BEER, J. W. (1987). ADVANTAGES, DISADVANTAGES AND DESIRABLE CHARACTERISTICS OF SHADE TREES FOR COFFEE, COCOA AND TEA.*

*AGROFORESTRY SYSTEMS 5:3-13.*

*COFFEE: OXFORD ENGLISH DICTIONARY IN THE OXFORD ENGLISH DICTIONARY ONLINE COFFEE GEEK - SO YOU SAY THERE'S A COFFEE CRISIS. RETRIEVED ON 2006-08-26.*

**WEEK 10**

**TOPIC: REVISION AND TEST**

**OBJECTIVES:** TO PROVIDE TIME FOR STUDENTS TO HAVE SELF STUDY ON WHAT THEY HAVE BEEN TAUGHT AND ASK QUESTIONS ON TOPICS WHERE THERE IS DOUBT FOR CLARIFICATION AND ALSO TO ASSESS THEIR UNDERSTANDING IN THE FOLLOWING AREAS:

- ON ALL THE TOPICS TAUGHT BETWEEN WEEKS 6 AND 9.

**WEEK 11**

**TOPIC: PRODUCTION OF COCONUT**

**OBJECTIVES:**

- ENUMERATE THE BOTANICAL CHARACTERISTICS OF THE CROP
- KNOW THE ORIGIN OF THE CROP
- HOW THE CROP IS BEEN ESTABLISHED, ITS AGRONOMY,
- KNOW THE CLIMATIC AND SOIL REQUIREMENTS FOR COCONUT,
- ENUMERATE THE DIFFERENT VARIETIES THAT EXIST IN THEIR ENVIRONMENT
- IDENTIFY AND DESCRIBE NURSERY AND FIELD MANAGEMENT OPERATIONS
- IDENTIFY SOME PESTS AND DISEASES THAT AFFECT THE CROP

- PROCESSING AND UTILIZATION OF THE FRUITS,
- STORAGE AND ECONOMIC VALUE OF THE FRUITS.

#### **DESCRIPTION**

##### **FIRST HOUR:**

- V. IDENTIFICATION, ORIGIN, CLIMATIC, SOIL AND NUTRITIONAL REQUIREMENT OF COCONUT
- VI. NURSERY REQUIREMENT AND FIELD ESTABLISHMENT

- **SECOND HOUR:** PEST AND DISEASES, PROCESSING AND UTILIZATION, STORAGE AND ECONOMIC VALUE OF THE FRUITS.

##### **STUDY QUESTION:**

1. DESCRIBE THE NURSERY MANAGEMENT REQUIRED FOR RAISING COCONUT
2. MENTION FIVE AGRONOMIC MANAGEMENT PRACTICES FOR COCOANUT PLANTATION
3. LIST FIVE USES OF COCONUT

#### **READING LIST**

FAO (1982). FRUIT BEARING FOREST TREES. TECHNICAL NOTES. FAO FORESTRY PAPER NUMBER 34, PP. 43-45. FAO, ROME.

OPEKE, L. K. (1992). "TROPICAL TREE CROPS," SPECTRUM BOOKS LTD., IBADAN.

#### **WEEK 12**

**TOPIC:** PINE APPLE

**GENUS:** - ANANAS

**SPECIE:** - COMOSUS

**BINOMIAL NAME:** - ANANAS COMOSUS

**OBJECTIVES:** AT THE END OF THE LECTURE, STUDENT SHOULD BE ABLE TO:

- KNOW THE ORIGIN OF PINE APPLE
- KNOW THE SOIL AND CLIMATIC REQUIREMENT OF THE CROP,
- IDENTIFY DIFFERENT VARIETIES OF PINE APPLE,
- DISCUSS DIFFERENT TYPES OF PLANTING MATERIALS,
- DESCRIBE NURSERY OPERATION REQUIRED FOR THE CROP,
- KNOW THE PLANTING AND ORCHARD MANAGEMENT,
- DESCRIBE ALL THE CULTURAL PRACTICES REQUIRED FOR ITS CULTIVATION,
  - MULCHING AND WEED CONTROL
  - FERTILIZER APPLICATION
  - PESTS AND DISEASE CONTROL E.T.C
- IDENTIFY PESTS AND DISEASES THAT AFFECTS PINE APPLE
- KNOW WHEN AND HOW TO HARVEST THE CROP,
- HIGHLIGHTS THE USES AND STORAGE METHODS

**STUDY QUESTIONS:** -

- MENTION FOUR METHODS OF PROPAGATING PINE APPLE,
- WHAT ARE THE CULTURAL PRACTICES REQUIRED IN THE PRODUCTION OF PINE APPLE
- LIST TWO VARIETIES OF PINE APPLE

**READING LIST:** -

BATHOLOMEW.C, DUANE P. AND KENNETH .G, ROGRBACH J (1993), FIRST INTERNATIONAL PINEAPPLE SYMPOSIUM. ACTA HORTICULTUREAE NUMBER 334.

COLLINS. J.I, (1949) HISTORY, TAXONOMY AND CULTURE OF THE PINEAPPLE. ECONOMIC BOTANY 3 (4) :335.

NIANG. A, RECHE.H, PLACE.F, LLUYOMALE. O.N, AKINTOYE.H A (2003) GUIDE TO IMPROVED NURSERY PRACTICES OF PINEAPPLE. NIHORT. IBADAN

NIHORT (1983-1986); ADVANCE IN FRUITS AND VEGETABLE RESEARCH . A COMMUNICATION PUBLICATION TO MARK THE 10<sup>TH</sup> ANNIVERSARY OF NIHORT IBADAN PAGES 20-22

OLAJIDE. L.O, OLANIYAN. A.A, LLUYOMADE. O.M AKINTOYE. H.A (2003). GUIDE TO IMPROVED NURSERY PRACTICES IN PINEAPPLE. PUBLISHED BY NATIONAL HORTICULTURAL RESEARCH INSTITUTE, IBADAN

RODIN. J.O, COAL SON. D.M, SILVERSTEIN R.M, LEEPER. R.W (1966) VOLATILE FLAVOUR AND AROMA COMPONENT OF PINEAPPLE. JOURNALS ON FOOD SCIENCE 30:668.

**WEEK 13 AND 14**

**TOPIC FOR THE WEEK: - OMEGA SEMESTER EXAMINATION**

**OBJECTIVES: -**

TO EVALUATE STUDENTS ON ALL THAT HAVE BEEN TAUGHT DURING THE SEMESTER