



LANDMARK UNIVERSITY, OMU-ARAN

COURSE COMPACT

COLLEGE: COLLEGE OF AGRICULTURAL SCIENCES
DEPARTMENT: CROP & SOIL SCIENCES
PROGRAMME: CROP SCIENCE
COURSE COMPACT FOR: ALPHA SEMESTER

Course

Course code: CRP 211
Course Title: Principles of Crop Production
Credit unit: 3 Units
Course status: Compulsory

Lecturer's Data

Name of the lecturer: Oluwagbenga Dunsin
Qualifications obtained: B.Sc, M.A, PhD (Crop Science)
Department: Crops and Soil Science
College: Agricultural science
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Office Location: Department of Crop & Soil Science, New College Building, Ground Floor, Room B007
Consultation Hours: Friday, 12 noon – 2 pm

Name of the lecturer: Christopher Muyiwa Aboyeji
Qualifications obtained: B.Sc, M.Sc, PhD (Crop Science)
Department: Crops and Soil Science
College: Agricultural science
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Office Location: Department of Crop & Soil Science, New College Building, Ground Floor, Room B008
Consultation Hours: Monday, 12 noon – 2 pm

Course Duration

Two Hours per week, for 15 Weeks (30 hours)

Course Content:

Crop Production and its Development; Principles, Problems, and Prospects of Crop Production; Cultural Practises In Crop Production; Cropping Systems; Pest and Diseases of Agricultural Crop; Irrigation and Drainages; Weeds and Weed Control; Harvesting and Processing of Field Crops; Storage of Farm Produces.

Course Description:

“Principles of Crop Production” is to introduce the fundamental principles upon which Crop Production practices are based. By studying the Principles of Crop Production, the students will be able to understand the interactions between the plant, the environment and how and why plants grow and develop. They will learn that the plants and their external conditions can be manipulated for better growth, development and yield.

Course Justification:

Crop production is a complex business, requiring many skills (such as biology, agronomy, mechanics and marketing) and covering a variety of operations throughout the year. For each component, the operations and when they need to be carried out, the skilled farmers need to have and use, potential environmental concerns related to that component and best management practices recommended to minimize low yield/loss of crops for sustainable crop production and food systems that are profitable, environmentally sound, energy efficient and improve the quality of life for both farmers and the public will be emphasized for the student.

Course objectives

The general objective of this course is to acquaint the students with the basic Principles of Crop Production.

At the end of this course, students should be able to:

- Classify plants based on botanical similarities, usefulness, growth cycle, indigenous, introduced (exotic) varieties, and response to climatic conditions;
- Understand the pattern in which crops are grown in a given area over a period of time and the technical and managerial resources that are utilized in the process of crop production;
- Identify the most appropriate fertilizer to apply to a particular crop in a given area and recommend the right time and quantity of fertilizer to apply;
- Describe the various tillage practices, state their effects and implements for carrying them out;
- Identify the most critical periods in the life of plant in relation to moisture and recommend irrigation programmes that are most appropriate;
- Understand the importance of drainage and the use of the different methods of drainage;
- Describe the various soil and water conservation methods;
- Identify the different types of weeds and their characteristics and recommend the most appropriate measure of weed control;
- Describe the common types of pests and their characteristics, nature of damage to

crop plants and identify the most appropriate control measures for effective control of pests;

- Identify the various kinds of plant diseases, symptoms of plant diseases and the general principles of disease control;
- Describe harvesting, thrashing, and processing of field crops;
- Identify and describe a quality grain and state measures of ensuring good grain quality; and
- Identify the common rodents and pests of crops in storage and describe the control measures to effectively tackle the problems of rodents and pests of storage.

Course Requirement:

The students must be regular and punctual in classes as lateness and other forms of unruly behaviour will not be condoned. Term Papers/Assignments must also be submitted at the appropriate time.

Method of Grading:

S/N	GRADING	SCORE (%)
1.	Continuous Assessments <ul style="list-style-type: none"> • C.AI • C.All (Mid-Semester Test) • C.Alll 	4% 10% 6%
2.	Practical	20%
3.	Final Examination	60%
4.	Total	100

Course Delivery Strategies

Lectures shall be delivered through face to face method using power point, theoretical materials provided during lectures and field trips. Students will be encouraged to search for further sources of information on the topics treated by using facilities at the university e-library and the main library. Students will also be encouraged to participate in tutorial sessions and review of study questions.

LECTURE CONTENT

- **Week 1: Crop Production and Its Development.**
- **Objectives :**The students at the end of the lectures for the week should be able to:
 - identify the centres and origin of most field crops
 - identify crops that are indigenous to Africa and those that are introduced into Africa
 - classify crops based on agronomic and special-purpose

➤ **Description**

First hour: Historical Development of Crop Production; centre of origins of cultivated crops and indigenous crop of Africa

Second hour: Classification of field crops

- **Study Question:** *State five centres of crop origin; Describe the botanical classification of field crops with examples*

➤ **Reading List :**

1. Herper, F. (1983). *Principles of Arable Crop Production*. Granada Publishing Ltd United Kingdom, Pp 1-9.
2. Martin, J. H. Waren, H. L. & Stamp, D. L. (1976). *Principles of Field Crop Production* (3rd ed.). New York: Macmillan Pub. Pp 3-26.

➤ **Week 2: Principles, Problems, and Prospects of Crop.**

➤ **Objectives :**

The students at the end of the lectures for the week should be able to:

- Identify those crops in which Nigeria occupies a premier position in terms of total global production figures of such crops.
- identify the constraints to crop production in Africa and measures of improving field crop production

➤ **Description**

First hour: Trends in Crop Production Nationally and Globally

Second hour: Constrains and methods of improving filed crop production

- **Study Question:** *Describe the factors that constitute constraints to crop production in Nigeria; What are the measures to increased food crop production in Nigeria?*

➤ **Reading List :**

1. Philips, T. P.; Taylor, D. S. Lateef Sanni & Akoroda, M. O.; (2004). *A Cassava Industrial Revolution in Nigeria the Potential for new Industrial Crop*. FAO Rome.
2. Rowland. J. R. J. (1993). *Dry Land Farming in Africa*. CTA, Netherlands: Wageningen. Pp.1-18.

➤ **Week 3: Cultural Practises in Crop Production.**

➤ **Objectives :**

The students at the end of the lectures for the week should be able to:

- learn about the overall aim of carrying out cultural operations in crop farms
- become familiar with the sequence of operations used in producing crops generally, and specific crops in particular
- understand the specific benefits of certain operations in crop production
- Understand the practical application of the various operations for profitable and environment-friendly crop production.

➤ **Description**

First hour: Pre-Planting Practises

Second hour: Post-Planting Practises

- **Study Question:** *Make a distinct classification of the cultural practices used by farmers in producing their crops*

➤ **Reading List :**

1. Harper, F. (1983). *Principles of arable Crop Production*. U.K: Blackwell Science Ltd.
2. GTZ-ITFSP. *Tree Crop Propagation and Management- a Farmer-Trainer Training Manual*. Module 3-Propagation i: Seed. <http://www.gtztreecrops.org/TrainingManuals.htm>

➤ **Week 4: Cropping System.**

➤ **Objectives :**

The students at the end of the lectures for the week should be able to:

- describe shifting cultivation the factors governing its rise and why it is no longer tenable
- identify practices that could enhance soil fertility while practicing continuous cropping
- state the advantages and disadvantages of each cropping system
- select the best cropping system in a given area based on the environmental conditions, crop growing pattern, nutrient status of the soil, sloppiness of the land etc.

➤ **Description**

First hour: Types and criteria used in clarifying cropping systems

Second hour: Advantages and disadvantages of each cropping systems

➤ **Study Questions:**

- (a) *What is crop rotation?*
- (b) *State the principles of crop rotation.*
- (c) *Mention the advantages of crop rotation.*
- (d) *Draw a three year crop rotation with the following crops, maize, cowpeas, cassava, and cotton.*

➤ **Reading List :**

1. *Martin, J. H. Waren H. L. & Stamp. D. L. (1976). Principles of Field Crop Production (3rd ed.). New York: Macmillan pub. Pp 166-172.*
2. *Onwueme, I. C. and Sinha, T. D. (1999). Field Crop Production in Tropical Africa. Netherlands: CTA, Wageningen. Pp. 103-117.*
3. *Rowland, J. R. J. (1993). Dry Land Farming in Africa. Netherlands: CTA, Wageningen, Pp.113-120.*

➤ **Week 5 & 6: Pest and Diseases of Agricultural Crops**

➤ **Objectives :**

The students at the end of the lectures for the week should be able to:

- define and classified pests according to feeding pattern and economic threshold of destruction
- state the effects of pest on crop production
- analyse and prescribe the best practices of pest control
- analyse the symptoms of plant diseases and identify the kind of diseases that may be affecting a particular crop based on the symptoms
- prescribe the methods of controlling plant diseases.
- Made an insect box

➤ **Description**

First week: Definitions and Classification of Pests

Second week: Plant Diseases

➤ **Study Questions:**

- 1. a. Define the term pests.
 - b. Categorise pests based on pattern of feeding.
 - c. Enumerate the direct effects of pests.
- 2. a. Distinguish between localized and systemic symptoms of plant diseases.

b. Give the generalized symptoms of plant disease.

➤ **Reading List :**

1. Adams, C. R. Bamford, K. M. and Early, M. P. (1984). *Principles of Horticulture*. Pp 91- 122.
2. Akinyosoye, V. O. (1976). *Senior Tropical Agriculture*. Pp 138-145.
3. Akobundu, I. O. (1987). *Weed Science in the Tropics*. Pp. 24-105.
4. Hill, D. S. and Waller, J. M. (1989). *Pest and Diseases of Tropical Crops*. Pp 3- 29.
5. Onwueme, I. C. (1979). *Crop Science*. Pp 37-44.
6. Rowland, J. R. J. (1993). *Dry land Farming in Africa*. Netherlands: CTA, Wageningen, Pp.138-141.
7. Taylor, T. A. (1977). *Crop Pest and Diseases*. Ibadan: Oxford University Press. Pp 1- 63.

➤ **Week 7 & 8: Irrigation and Drainage**

➤ **Objectives :**

The students at the end of the lectures for the week should be able to:

- define irrigation and drainage
- state the objectives of irrigation and drainage
- describe the various methods of irrigation and drainage
- state the advantages and disadvantages of each method of irrigation and drainage.

➤ **Description**

First week: Definition of irrigation and irrigation methods

Second week: Drainage systems

➤ **Study Question:** *Define the term irrigation and state why it is important.*

Define the term drainage and state why it is important.

➤ **Reading List :**

1. *Agricultural Extension & Research Liaison Services A. B. U. Zaria, Irrigation and Drainage; Extension Guide No 35 Irrigation Series No1. Pp 1-12.*
2. Olaitan, S. O. and Lombin, G. (1988). *Introduction to Tropical Soil Science*. London: Macmillan Pub. Pp 103-116.
3. Onwueme, I. C. and Sinha, T. D. (1999). *Field Crop Production in Tropical Africa*. Netherlands: CTA, Wageningen, Pp. 77-102
4. Rowland, J. R. J. (1993). *Dry Land Farming in Africa*. Netherlands: CTA, Wageningen, Pp.11-18.

➤ **Week 9: Weeds**

➤ **Objectives :**

The students at the end of the lectures for the week should be able to:

- define a weed and enumerate the harmful effects of weeds
- classify weeds based on life span and controllability
- list the beneficial and harmful effects of weeds
- name the common weeds found in the locality and in Nigeria (weed album)
- explain the mechanisms of seeds dispersal in weeds
- recognize the most critical periods in the life of plants when weeds infestation has the highest effect and when control measures would produce the most desired result.

➤ **Description**

First hour: Classification and characteristics of weeds

Second hour: Some common weeds of west Africa

➤ **Study Question:** *Define the term weeds.*

b. State the characteristic of weeds which make them excellent competitors with the crop plants.

➤ **Reading List :**

1. Akobundu, I. O (1987). *Weed Science in the Tropics*. Pp. 24-10.
2. Martin, J. H, Waren H. L. & Stamp, D. L. (1976). *Principles of Field Crop Production (3rd ed.)*. New York: Macmillan Pub. Pp 303-317.
3. Onwueme, I. C and Sinha, T. D. (1999). *Field Crop Production in Tropical Africa*. Netherlands: CTA, Wageningen, Pp. 143-154.
4. Onwueme, I. C (1979), *Crop Science*. Pp 37-44.
5. Rowland, J. R. J. (1993). *Dry Land Farming in Africa*. Netherlands: CTA, Wageningen, Pp.130-134.

➤ **Week 10: Weeds control**

➤ **Objectives :**

The students at the end of the lectures for the week should be able to:

- state the basic principles of weed control

- suggest the most suitable method of weed control in a particular crop and locality
- draw a crop rotation system that could tackle effectively a given sets of weeds in a given locality
- identify suitable biological methods of controlling certain weeds.

➤ **Description**

First hour: Principles of weeds control

Second hour: Integrated weed management system

➤ Study Question: *State the principles of weed control.*

b. What is weed eradication? And what are conditions necessitating it?.

➤ **Reading List :**

1. Akobundu, I. O. (1987). *Weed Science in the Tropics*. Pp. 24-105.
2. Martin, J. H, Waren H. L. & Stamp, D. L. (1976). *Principles of Field Crop Production (3rd ed.)*. New York: Macmillan Pub.. Pp 303-319.
3. Onwueme, I. C and Sinha, T. D. (1999). *Field Crop Production in Tropical Africa*. Netherlands: CTA, Wageningen, Pp. 143-154.
4. Onwueme, I. C. (1979). *Crop Science*. Pp 37-44.
5. Rowland, J. R. J. (1993). *Dry land Farming in Africa*. Netherlands: CTA, Wageningen. Pp.130-134.

➤ **Week 11 & 12 : Harvesting and Processing of Field Crops**

➤ **Objectives :**

The students at the end of the lectures for the week should be able to:

- identify different stages of crop maturity and subsequently, recommend the most appropriate stage to harvest field crops
- describe the different harvesting and threshing methods of rice, maize, millet and sorghum
- describe the methods of cleaning, drying and grading of grains and be able to make appropriate recommendation as to the best method of carrying out the above mentioned processes

- describe quality characteristics of grains intrinsic and induced qualities.

➤ **Description**

First week: Methods of Harvesting and Threshing Nigeria Major Field Crops

Second week: Standardization and Grading of Grains

➤ **Study Question:**

(a) Briefly describe rice harvesting methods.

(b) Briefly describe maize thrashing methods.

(c) What are the advantages of quality grading and standardization?

➤ **Reading List :**

1. Martin, J. H. Ware H. L. & Stamp, D. L. (1976). *Principles of Field Crop Production* (3rd ed.). New York: Macmillan pub.. Pp 211-239.
2. Proctor, D. I. (1994). *Grain Storage Techniques- Evolution and Trends in Developing Countries*. FAO Agricultural Service Bulletin-109, Rome, Italy.

➤ **Week 13 & 14: Storage of Farm Produce**

➤ **Objectives :**

The students at the end of the lectures for the week should be able to:

- define storage and state the importance of storage to the economy of Nigeria
- describe the different methods of storage of farm produce
- identify the most effective methods of grain storage
- describe rodents pest of stored product and state the principles of rodent control
- describe the integrated stored pest management system.

➤ **Description**

First hour: Methods of Storages and Its Role in the Economy

Second hour: Integrated Pest Management (IPM) in Storage

➤ **Study Questions:**

1a. Discuss the significance of storage to Nigerian economy.

- b. Discuss the methods of temporary storage commonly employed by local farmers in your locality.*
- 2a. *Discuss the integrated pest management of stored products.*
- b. Briefly explain the basic principles upon which any rodent control strategies should be based.*

➤ **Reading List :**

1. *Martin, J. H. Ware H. L. & Stamp, D. L. (1976). Principles of Field Crop Production (3rd ed.). New York. Macmillan Pub. Pp 114-136.*
2. *Proctor, D. I. (1994). Grain Storage Techniques- Evolution and Trends in Developing Countries. FAO Agricultural Service Bulletin-109, Rome, Italy.*
3. *Taylor, T. A. (1977). Crop Pests and Diseases. Ibadan Oxford University Press. Pp 1-63.*

➤ **Week 15: Examination**

➤ **Objectives:**

- To examine the students on all that has been taught during the semester.

List of Practical:

1. Collection, identification and importance of some agricultural pest (insects and mammals)
2. Presentation and presentation of an insect box
3. Recognition and identification of diseased organs of a crop
4. Familiarization with crop production/processing equipment (operation and maintenance)
5. Identification of different crop weeds and methods of weed control.
6. Presentation and presentation of weed album
7. Establishment and management of agricultural crop