

COURSE COMPACT

Course

Course code:	CRP 523
Course Title:	Weed Science and Control (3 Units)
Course status:	(Compulsory)

Course Duration

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

Lecturer Data

Name of the lecturer:	Dunsin oluwagbenga ¹ Aboyeji Christopher Muyiwa ² Ige Sunday Ayodele ³
Qualifications obtained:	B.Sc, M.A, PhD (Crop Science) ¹ B.Sc, M.Sc, PhD (Crop Science) ² B.Sc, M.Sc, PhD (Genetics and Plant breeding) ³
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

Course Content:

The field of weed science is a relative newcomer to the agricultural arena. However, the innovations and developments that have stemmed from the research in this area have had a major impact on agricultural practices and productivity. The course will emphasize on areas on: weed biology and ecology, an introduction to weed management techniques and methodologies, factors affecting weed control, and environmental issues (emphasis on chemical weed control) associated with weed management.

Course Description:

The goals of weed science remain the same, to identify and establish effective weed management strategies in order to reduce detrimental effects to agricultural crops; however, these practices now include a greater focus on sustainable agricultural and environmental

conservation. Management strategies include an array of cultural practices and ideas that not only work to suppress weed populations but also help to preserve the environment.

Course Justification:

Uncontrolled weed growth now causes more crop yield loss, and human spend more time removing weeds in the tropics, than in any part of the world. Little knowledge on the science and principle of tropical weeds and wrong management practices in controlling the weeds have led to the uncontrolled weed growth. This course is meant to educate young scientist on the biology and best management practice in controlling tropical weeds

Course objectives

To provide students with an appreciation and better understanding of the discipline of Weed Science, explain modes of spread, and describe population ecology of weeds and other invasive plant species. Emphasis will be placed on sustainable management utilizing an integration of biological, cultural, mechanical, and chemical manipulations of weeds and invasive species. Additionally methods of crop and vegetation management to manage and reduce weed populations will be discussed. Throughout the course, applied examples will be used to generate discussion and aid in the students' ability to formulate integrated weed management programs.

Attendance:

It is expected that every student will be in class for lectures and also participate in all practical exercises. Attendance records will be kept and used to determine each person's qualification to sit for the final examination. In case of illness or other unavoidable cause of absence, the student must communicate as soon as possible with any of the instructors, indicating the reason for the absence.

Academic Integrity:

Violations of academic integrity, including dishonesty in assignments, examinations, or other academic performances are prohibited. You are not allowed to make copies of another person's work and submit it as your own; that is plagiarism. All cases of academic dishonesty will be reported to the University Management for appropriate sanctions in accordance with the guidelines for handling students' misconduct as spelt out in the Students' Handbook

Assignments and Group Work:

Students are expected to submit assignments as scheduled. Failure to submit an assignment as at when due will earn such candidate zero for that assignment. Only under extenuating circumstances, for which a student has notified any of the instructors in advance, will late submission of assignments be permitted.

Code of Conduct in Lecture Rooms and Laboratories:

Students should turn off their cell phones during lectures. Students are prohibited from engaging in other activities (such as texting, watching videos, etc.) during lectures. Food and drinks are not permitted in the laboratories.

Method of Grading:

S/N	Grading	Score (%)
1	Short Quizzes/Class-Work	5
2	Attendance	5
3	Continues Assessment	20
4	Final Examination	70
	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: Introduction to Weed Science and Management

Objectives: The students at the end of the lectures will be able to know and understand the meaning of “weed” and the history of weed science and management

Description: The course outline will be introduced with emphasis on the objectives and delivery strategies, the definition and scope of the course as well as the importance of weed science and control to crop yield.

Study Question: Define the term “weed”

Reading List:

- ✓ Appleby, A.P. (2005). *A History of Weed Control in the United States and Canada - A Sequel*. *Weed Sci.*, 53: 762-768.
- ✓ Green, J.M., C.B. Hazel, D.R. Forney, and L.M. Pugh. (2008). *New Multiple Herbicide Resistance and Formulation Technology to Augment the Utility of Glyphosate*. *Pest Manag. Sci.*, 64: 332-339.
- ✓ Timmons, F.L. (2005). *A History of Weed Control in the United States and Canada*. *Weed Sci.*, 53: 748-761.
- ✓ Ward, S.M., J.F. Gaskin, and L.M. Wilson (2008). *Ecological Genetics of Plant Invasion: What do We Know? Invasive Plant Science and Management*, 1: 98-109.

➤ Week 2 & 3: Weed Biology.

Objectives: The students at the end of the lectures for the week will learn about the:

- Characteristics of Weedy Plants.
- Classification of weeds
- Reproduction in Weeds
- Economics importance of weeds

Description: Weed biology will give the students on what does a weed look like? How can one distinguish a weed from other plants or crops? Do weed individually or collectively have recognizable characteristics? The losses caused by weeds in agriculture, beneficial effects of weeds, Life Cycle Stages and Life History of tropical weeds, weed seed production and germination.

Study Question: Describe the factors that affect weed seed germination?

Reading List:

1. Ross, M.A. and C.A. Lembi (1999). *Applied Weed Science*. Prentice Hall, Upper Saddle River, New Jersey, 2nd Ed.
2. Sutherland, S. (2004). *What Makes a Weed a Weed: Life History Traits of Native and Exotic Plants in the USA*. *Oecologia*, 141: 24-39.
3. Swanton, C.J., K.J. Mahoney, K. Chandler, and R.H. Gulden (2008). *Integrated Weed Management: Knowledge-based Weed Management Systems*. *Weed Sci.*, 56: 168-172.

➤ Week 4: Weed Ecology and Distribution.

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

- ✓ Learn about the persistence and survival mechanisms of weeds
- ✓ Become familiar with crop mimicry

- ✓ Factors affecting weed persistence

Description: This course tends to look at the characteristics, adaptation and survival mechanisms of weeds that enable them to exploit environmental resources and successfully colonize new habitats often at the expense of other neighbouring plants.

Study Question: *What are the factors affecting weed persistence*

Reading List:

- ✓ Akobundu, I. O. (1986). *Weed Science in the Tropics. Principles and Practices.* John Wiley & Sons.

➤ **Week 5 : FIRST CONTINUOUS ASSESSMENT TEST**

Objectives: To assess the students on the topics taught so far in the previous weeks.

Description: The test is to assess the students and each student is expected to attempt the prescribed number of questions on the test. The Minimum duration of the test will be 45 minutes and maximum duration of 1 hour.

➤ **Week 6: Weed Crop Competition/Interference.**

Objectives:

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

- ✓ Mode of interaction between two organisms
- ✓ Factors affecting competition and interaction of weed and its environment
- ✓ Mechanisms of biological interaction among organisms, e.g. Allelopathy, Parasitism

Description: farmers typically views all weeds as serious enemies of crops, but topics tend to capitalized on some crops attribute that have adverse effects on weeds by understanding the intricate interactions involved in weed-crop interaction.

Study Questions: *What are the crop factors that affect competition?*

Reading List:

- ✓ Akobundu, I. O. (1986). *Weed Science in the Tropics. Principles and Practices.* John Wiley & Sons.

➤ **Week 7: General Principles of Weed Control**

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

- ✓ Define the term weed eradication and weed management
- ✓ Knows the different kind of weed control methods

Description: The topic tends to focus on different methods use in weed control (or those

which are applicable) in a planned, coordinated management scheme for optimal crop yield and considering the environment.

Study Questions: *What do you understand by integrated weed management?*

Reading List:

- ✓ *Akobundu, I. O. (1986). Weed Science in the Tropics. Principles and Practices. John Wiley & Sons.*

➤ **Week 8: Cultural Weed Control**

Objectives: The students will learn the basis of the management tactics with an understanding of how and to what extent farming practices affect weed populations, these cultural practices can be manipulated in such a way that weed species can be controlled while reducing economic loss and preserving environmental resilience

Description: cultural weed control includes all aspects of good crop husbandry used to minimize weed interference with crops. These consist of hand weeding, mechanical weeding, tillage, mulching, burning, flooding and crop rotation for basic crop production effort and yield.

Study Question: *How those tillage help to control weed in crop production*

Reading List:

- ✓ *Akobundu, I. O. (1986). Weed Science in the Tropics. Principles and Practices. John Wiley & Sons.*

➤ **Week 9: Biological Weed Control**

Objectives: The topic will aim at teaching students the biological way of weed control and strategy that relies on selective pathogens and weed seed predators to reduce weed populations to non-competitive numbers rather than seek total weed control.

Description: Biological weed control show cases the use of a living organism (a natural enemy) to reduce weed populations to economically acceptable levels. Key concern is that the bio-control agent is very host specific (does not harm crops or other beneficial vegetation).

Study Question: *Define the term allelopathy.*

Reading List:

- ✓ *Akobundu, I. O. (1986). Weed Science in the Tropics. Principles and Practices. John Wiley & Sons.*

➤ **Week 10 :SECOND CONTINUOUS ASSESSMENT TEST**

Objectives: To assess the students on the topics taught so far in the previous weeks.

Description: The test is to assess the students and each student is expected to attempt the prescribed number of questions on the test. The Minimum duration of the test will be 45 minutes and maximum duration of 1 hour.

➤ **Week 11 & 12: Chemical Weeds control**

Objectives: The students at the end of the lectures for the week will learn:

- ✓ Herbicide nomenclature and Categories of Herbicides
- ✓ Types of Herbicide Applications
- ✓ Formulation of herbicides
- ✓ Storage of herbicides

Description: Chemicals used to kill or adversely affect plant growth are known as herbicides. The practice by which undesirable vegetation is killed with herbicides is called chemical weed control. The ability of chemical to kill weed plant at large scales has made it more popular than manual or other weed control methods.

Study Question: *Differentiate between* Selective and Non-selective herbicides.

Reading List:

- ✓ *Akobundu, I. O. (1986). Weed Science in the Tropics. Principles and Practices. John Wiley & Sons.*

➤ **Week 13 : Herbicides In The Environment And Safe Use**

Objectives: The topic will provide students with better understanding and knowledge on:

- ✓ Effects of herbicides in the air, water, plant and soil.
- ✓ Toxicity and handling of herbicides

Description: All herbicides are by definition toxic to some form of living organism, but herbicides are important and essential components of weed management in world agriculture especially the tropics. If herbicides are properly handled, they will continue to play useful roles in food production throughout the world

Study Question:

- ✓ *What are the factors affecting foliar uptake of herbicides*
- ✓ *What essential items needed during spraying of herbicides*

Reading List:

- ✓ *Akobundu, I. O. (1986). Weed Science in the Tropics. Principles and Practices. John Wiley & Sons.*

➤ Week 14: Preventive and Integrated Weed Management in Nigeria

Objectives: The students at the end of the lectures will:

- ✓ Learn measures necessary to prevent introduction of new weeds species
- ✓ Develop a system of weed control that incorporates many tactics to achieve long-term suppression.

Description : Today's agricultural producers rely heavily on tillage and chemical methods to achieve adequate weed suppression; however, the ability of weed species to quickly adapt and shift according to management techniques has led to increased incidence of herbicide-resistant weed populations as well as weed communities that can withstand the effects of tillage. The continued reduction in efficacy of conventional control techniques, combined with environmental concerns and rising input costs, has increased the demand for alternative weed control options.

Study Questions: *Discuss the significance of Integrated Weed Management to crop production.*

Reading List:

- ✓ *Akobundu, I. O. (1986). Weed Science in the Tropics. Principles and Practices. John Wiley & Sons.*

➤ Week 15: MOCK EXAM & REVISION

Objectives: To assess the students on the topics taught so far in the previous weeks.

Description: The test is to assess the students and each student is expected to attempt the prescribed number of questions on the test. The Minimum duration of the test will be 45 minutes and maximum duration of 1 hour.