

DEFINITION OF PLANT PATHOLOGY

I. Introduction

As discussed from the last module, crop protection has an important role in global food security. Its aim is to limit the crop losses and damage to its minimum while during production, harvesting, and post-harvest handling. The role of pest in these scenario needs of a solid control measure formulated through researches on its biological structures and activities.

Plant pathology is a discipline closely related to crop protection. In this module, we will discuss definition of plant pathology from various organizations, institutions, and sources. Also included here is the etymology or word history of phytopathology as well as its components as a science and as an art. We will find out what the main objectives of plant pathology and its importance.

II. Learning Objectives

At the end of this module, the students are expected to:

1. Define Plant pathology.
2. Recall the word history of phytopathology.
3. Describe plant pathology as a science and as an art.
4. Explain the objectives of plant pathology.

III. Pre-Test

Question

For you, what is plant pathology?

Question

What do you think is the importance of plant pathology in crop production?

Question

Give a sample situation where plant pathology is applied in farming.

IV. Discussion

Etymology

Phytopathology came from Greek word *phyton* meaning "plant," and literally "that which has grown"; from *phyein* meaning "to bring forth, make grow"; *Pathos* meaning "suffering"; and *logos* or study. It is the study of suffering plants or the management of diseases to minimize losses.

Definition

According to *Merriam-Webster Dictionary*, the Medical Definition of plant pathology is "a branch of botany concerned with the diseases of plants" — called also phytopathology.

According to *Canadian Phytopathological Society*, the science of plant diseases is called plant pathology, or phytopathology.

According to the *Department of Agriculture of Republic of South Africa*, Plant Pathology is defined as the study of the organisms and environmental conditions that cause disease in plants, the mechanisms by which this occurs, the interactions between these causal agents and the plant (effects on plant growth, yield and quality), and the methods of managing or controlling plant disease. It also interfaces knowledge from other scientific fields such as mycology, microbiology, virology, biochemistry, bio-informatics, etc.

According to *Tamil Nadu Agricultural University in India*, Plant pathology or phytopathology is the science, which deals with the plant diseases. It is concerned with health and productivity of growing plants. Phytopathology is the branch of agricultural, botanical or biological science which deals with the cause, etiology (aetiology), resulting in losses and management methods of plant diseases. Plant pathology can also be defined as the study of the nature, cause and prevention of plant diseases. Plant pathology is related to most of the old and new sciences like biology, physics, chemistry, physiology, mathematics, genetics, soil science, biochemistry, biotechnology etc.

Two Important Components of Plant Pathology

Plant Pathology is the study of the organisms or environmental factors that caused disease in plants; of the mechanism by which these factors induce disease in plants; and of the methods of preventing or controlling disease and reducing the damage it causes. It is also the art of dealing with the application of knowledge gained from studying science which includes disease diagnosis, assessment, forecasting, recommendation and appropriate control and field application of suitable control. It has two important components:

1. As a Science
 - a. To understand the nature of plant diseases
 - i. Cause – etiology of plant disease
 - ii. Plant-pathogen interaction
 - iii. Factors affecting disease development
 - iv. Means of control
2. As an Art
 - a. Process where science made useful; is doing or applying knowledge gained in science.
 - i. Disease diagnosis
 - ii. Assessment and forecasting
 - iii. Recommend control measure

Plant Pathology deals with the nature, causes and control of plant diseases. It is a science which looks into the characteristics of the diseases, their causes, plant-pathogen interactions, factors affecting disease development in individual plants and in populations, and various means of controlling diseases

As a science also, Plant Pathology tries to increase our knowledge about plant diseases. It tries to develop methods, equipment and materials through which plant disease can be avoided or controlled. Since the control of plant diseases has depended increasingly on the use of pesticide, much of the modern researches in plant pathology aim at finding other environmental friendly means of controlling plant diseases.

The art of plant pathology deals with the application of the knowledge gained from studying it as a science. This includes the following:

- a) diagnosis or recognizing particular diseases by their symptoms and sign; diseases assessment and forecasting;
- b) recommendation of appropriate control measures; and
- c) field application of suitable of control measures

Objectives of Plant Pathology

The ultimate objective of plant pathology is to prevent or minimize plant diseases not only to increase food production but also to maintain the quantity and quality of the harvested fresh community until it reach the final consumer. We also need to protect and preserve plant used for fiber, drugs and aesthetics.

Plant pathology has the following major objectives.

1. To study biotic (living), mesobiotic and abiotic (non-living and environmental) causes of diseases or disorders.
2. To study the mechanisms of disease development by pathogens.
3. To study the plant (host)-pathogen interaction in relation to environment.
4. To develop methods of management of plant diseases.

V. Activity

Name:	SCORE:
Course, Year and Section:	
Instructor:	
Date of Submission:	

Laboratory Exercise No. 1
IMPORTANT TERMS IN PLANT PATHOLOGY

I. INTRODUCTION

Terminologies in plant pathology are very important to ensure proper naming, identification and diagnoses of plant problems and diseases. Familiarization with different terminologies and accurate definition of the terms will help in the development of exact concepts and correct preventive measures for our crop production practice. The following terms and definitions are basic to the study of plant pathology. In addition, expertise with the vocabulary words and skill will develop through exposure to diagnostics, experience and correct use of the appropriate terms.

II. OBJECTIVES

To familiarize important terminologies used in plant pathology.

III. MATERIALS

1. Ballpen
2. Reference books, lectures or reliable internet sources

IV. METHODOLOGY

1. Carefully write and define the following terms indicated below in the answer space provided.
 - 1.1. Pathogen;
 - 1.2. Parasite;
 - 1.3. Obligate parasite;
 - 1.4. Facultative parasite;
 - 1.5. Host

- 1.6. Pathogenicity;
- 1.7. Pathogenesis;
- 1.8. Virulence;
- 1.9. Resistance;
- 1.10. Susceptibility;
- 1.11. Tolerance;
- 1.12. Causal agent;
- 1.13. Plant injury;
- 1.14. Virulent;
- 1.15. Autotrophs;
- 1.16. Saprophytes;
- 1.17. Host range;
- 1.18. Symbiosis;
- 1.19. Disease cycle;
- 1.20. Propagules;
- 1.21. Inoculation;
- 1.22. Inoculum;
- 1.23. Repeating cycle;
- 1.24. Monocyclic;
- 1.25. Polycyclic;
- 1.26. Transmission;
- 1.27. Vector;
- 1.28. Infection;
- 1.29. Infection court;
- 1.30. Infestation;
- 1.31. Colonization;
- 1.32. Epidemic;
- 1.33. Endemic;
- 1.34. Epidemiology;
- 1.35. Epidemic rate;
- 1.36. Taxonomy;

- 1.37. Pest;
- 1.38. Microorganism;
- 1.39. Masked symptoms; and
- 1.40. Symptomless carrier.

V. OUTPUT

NO.	TERM	DEFINITION
1	Pathogen	
2	Parasite	
3	Obligate parasite	
4	Facultative parasite	
5	Host	
6	Pathogenicity	
7	Pathogenesis	
8	Virulence	
9	Resistance	
10	Susceptibility	
11	Tolerance	

12	Causal agent	
13	Plant injury	
14	Virulent	
15	Autotrophs	
16	Saprophytes	
17	Host range	
18	Symbiosis	
19	Disease cycle	
20	Propagules	
21	Inoculation	
22	Inoculum	
23	Repeating cycle	

24	Monocyclic	
25	Polycyclic	
26	Transmission	
27	Vector	
28	Infection	
29	Infection court	
30	Infestation	
31	Colonization	
32	Epidemic	
33	Endemic	
34	Epidemiology	
35	Epidemic rate	
36	Taxonomy	
37	Pest	

VII. REFERENCES

VI. Summary

- Plant Pathology or phytopathology is the study of plant diseases. It covers its biological structure and activities, taxonomical classification, propagation, crop damage, and control.
- Its word origin came from Greek word *phyton* meaning "plant," and literally "that which has grown"; *Pathos* meaning "suffering"; and *logos* meaning study.
- As a science, it aims to understand the nature of plant diseases and as an art, it aims to determine its application and actual use in the field of agriculture.
- Its main objective is to prevent or minimize plant diseases not only to increase food production but also to maintain the quantity and quality of the harvested fresh community until it reach the final consumer.

VII. References

Agrios GN (1972). *Plant Pathology* (Third Edition). Academic Press.

Internet Source

https://s3.wp.wsu.edu/uploads/sites/2054/2014/04/TermsandDefinitions_001.pdf