

Plant health

At the end of the course, you will know examples of diseases of plants caused by bacteria, fungi, oomycetes, viruses and viroids as well as the major traits that distinguish these different types of organisms. You will learn where to find information about causes of disease, the important environmental factors that are favorable for disease and the available methods of control. You will also understand the importance of knowledge about the ecology of plant pathogens for developing methods of control that reduce the amounts of synthetic pesticides used in disease management.

• **Plant health part 1** **Total 16HCM, 4HTD** Cindy Morris, Marc Bardin

The objective of this course is to provide you with an introduction to the basic concepts of Plant Pathology and plant health management. You will learn 1) the definitions of plant disease/plant health and the principles of etiology, 2) concepts concerning disease epidemiology and 3) strategies of disease management. You will also become familiar with the full array of microorganisms that can cause harm to plants including bacteria, fungi, viruses and viroids. The course will include a series of lectures providing the basics of plant pathology and homework where you will prepare and give a talk on the main phytosanitary problems encountered on cultivated plants.

- ✓ Introduction to Plant Pathology (6HCM Cindy Morris)
- ✓ Principles of plant pathology (10HCM, 4HTD Marc Bardin)

• **Plant health part 2** **Total 4,5HCM, 8HTD** Marc Bardin, Cindy Morris

The objective of the course is to expose students to a range of advanced topics related to the complex factors intervening in plant health and their consideration when establishing integrated pest management of cropping systems. You will have opportunities to debate and present critical evaluation of different types of plant health scenario and paradigms. Principles and challenges of integrated pest management and integrated plant health management. Brief overview of and historical perspective on the concept of IPM/IPHM and the main tools that can be applied. Project: design an IPHM strategy based on the analysis of the existing state of the art for a crop and production system, identify key challenges that would require research work, and propose one detailed research action

Biological control of plant diseases. The main types of biocontrol agents against diseases, their modes of actions and the key factors of their efficacy in the field.

Debate: What is plant health/disease? Acknowledge the "paradox" that microbial symbionts and biocontrol agents deploy many of the same molecular strategies as pathogens. Understand that plant "health" and "disease" are subjective concepts. Discuss how this understanding could be useful in developing strategies to manipulate plant-microbe interactions for outcomes that are favorable for plant production.

Frost damage: how a microorganism can cause abiotic damage. Learn about the processes involved in frost damage to plants and how it can be catalyzed by certain plant-associated microorganisms

- ✓ Principles and challenges of Integrated Pest Management and Integrated Plant Health Management part 1 & 2 (1,5HCM, 1,5HTD) Marc Bardin
- ✓ What is Plant Disease? (2,5H TD) Cindy Morris
- ✓ Biological control of plant diseases, part 1-2-3 (3HCM, 2HTD) Marc Bardin
- ✓ Frost Damage: Biotic origins of an abiotic disease (2HTD) Cindy Morris