Note for the reader

This module is designed to empower biologists with a powerful analytical tool. Yet, we have endeavored to develop it with as little calculus and mathematics, and in fact with the hope that readers would discover, enjoy, and explore the field by themselves.

Student
Even if it is primarily intended to graduate students, this material is intended to undergraduate students too. Undergraduate students will gain some exposure to plant pathology, plant protection, systems analysis, and from a technical viewpoint, to simulation modeling applied to ecological systems. Introductory and transition sections are especially meant to be accessible to a very wide audience. Graduate students will be able to explore this material more in depth.

Instructor
This module can be used in class as well as for practical work. It provides the basic concepts, methods, and approaches in the field of systems analysis applied to botanical epidemiology. Simulation models are used to that aim, and applied to the dynamics of epidemics and yield losses.

Other reader
Most of this material is highly visual, and so readily accessible. Although the underpinning concepts can be rather sophisticated, the material assembled here is meant to invite thoughts, and if possible inspire. No prior specific knowledge in calculus, systems analysis, or even plant pathology is required, since these are introduced progressively, when necessary.

Organization and content
This module is organized as follows:
- A general introduction to simulation models (Chapter 1)
- A presentation of concepts and basic examples (Chapters 2 - 3)
- Simulation modeling in plant disease epidemiology (Chapters 4 - 6)
- Two transition chapters, providing a perspective of simulation modeling in plant disease epidemiology (Interlude) and an introduction to the next sections (introduction to yield loss modeling)
- Simulation modeling of crop growth, yield losses, and their applications to rice and wheat (Chapters 7 - 9)
- A discussion on the concepts associated with model evaluation (Chapter 10)
- Two technical annexes (Instructions to run the simulation models; Simulation models to upload)