Plant Pathology Research Unit

Research area

The research objective of the Plant pathology research unit is to contribute to the development of rational and efficient disease control methods that are compatible with a sustainable and high quality production.

To achieve this goal, our research are developed around the themes of etiology of emerging diseases, evolutionary ecology of plant pathogens, epidemiology, and development of control methods in order to mobilize them in integrated pest management (IPM) strategies. Our research is focused on bacterial, fungal and viral diseases of fruits and vegetables typically produced in the Mediterranean basin. Studies are also conducted on Ceratocystis canker of plane trees and viral diseases of ornamental crops.

Research highlights

- Development of rapid, simple and reliable diagnostic methods,
- Cultivation of plant varieties with durable disease resistance,
- Use of pre-emptive biological control agents,
- Predicting disease by understanding the ecology and evolution of plant pathogens and disease epidemiology.

Our expertise concerns the characterization of genetic and phenotypic diversity of plant pathogens, the analysis of variability potential of plant pathogens, the study of the conditions that enhance the spread of epidemics, the evaluation of the impact of biotic and abiotic factors on the effectiveness and durability of control methods and the modeling of the evolutionary steps of plant pathogenic variation both at the plot and landscape scales.

For the past 20 years we have been contributing to the development of disease resistant lines in collaboration with the fruit and vegetable genetics and breeding RU at Avignon (GAFL). Pathogen ecology and disease epidemiology studies have led to the development of biological control agents. Our present research aims at evaluating the durability of disease resistance and of biological protection agents.

Our research relies on a close partnership with stakeholders in agricultural development and scientific cooperation on the national and international levels.

Platforms and other tools

- Microscopy laboratory: light and electron (TEM and SEM) microscopy, cell imaging and data treatment.
- Fully-equipped laboratories for isolation, preservation and characterization of bacteria, fungi and viruses.
- Serology laboratory.
- Molecular biology platform with diversified and modern equipment.
- Around 7000 m² of experimental fields (770 m² of tunnels), 1700 m² of greenhouses, 340 m² of containment greenhouses, 10 plant growth chambers.

(1) Bacterial canker on apricot tree (2) Conidiophore of Botrytis cinerea (left) & confrontation of B. cinerea with a biocontrol agent (right) (3) Zucchini yellow mosaic virus (ZYMV) symptoms on zucchini