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UR0407

Plant Pathology Research Unit

Management

Eric Verdin, director
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director
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Research axes

- Etiology of plant diseases
- Epidemiology, ecology, evolution
- Efficiency and durability of crop protection strategies

In brief

- 13 researchers
- 11 engineers
- 14 technicians
- Students, PhD, post-docs

Mission and objectives

The research objective of the Plant Pathology research unit is to contribute to the development of effective and durable plant disease control methods that are compatible with a high-quality agricultural production mobilizing the principles of agroecology.

To achieve this goal, our research focuses on etiology of emerging diseases, evolutionary ecology and epidemiology of plant pathogens. Our research is focused on viral, bacterial and fungal diseases of fruit and vegetable crops typically produced in the Mediterranean basin. Studies are also conducted on viral diseases of ornamental crops.



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

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Research

- Development of rapid, simple and reliable diagnostic methods to identify emerging threats of horticultural crops;
- Understanding the evolutionary ecology of plant pathogens to better characterize their life history in and outside the agricultural context;
- Identification of the main drivers of epidemics in order to predict their development;
- Development of strategies for the selection and the durable management of varietal disease resistance and biocontrol agents.

Our expertise concerns the analysis and characterization of genetic and phenotypic diversity of plant pathogens, their evolutionary potential, the conditions that enhance epidemic spread, the modelling of epidemics both at the plot and landscape scales and the impact of biotic and abiotic factors on the efficacy and durability of control methods.

Our studies contribute to the development of crop protection tools compatible with agroecology (e.g. prophylaxis, varietal resistance, biocontrol), to the evaluation of their efficacy and durability in a context of global change and to their mobilization in integrated pest management (IPM) strategies.

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



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Platforms and other tools

- Fully-equipped microbiology and serology laboratories for isolation, preservation and characterization of bacteria, fungi and viruses.
 - PROPHYLE platform including:
 - an Etiology Pole;
 - a Microscopy Pole, with light microscopes (epifluorescence and confocal) and electron microscopes (transmission and scanning), cell imaging and data treatment;
 - an Experimental facilities Pole (certified ISO 14001) including :
 - 6000 m² of experimental fields,
 - 800 m² of plastic tunnels,
 - 1700 m² of glasshouses,
 - 340 m² of level 3 containment glasshouses,
 - 15 plant growth chambers.
- This pole also includes a workshop for equipment maintenance and the creation of prototypes.
- Molecular biology platform with diversified and modern equipment.
 - Pathobase Information System dedicated to the management and traceability of samples and related data.



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