

**MAFEN MASTER**

**Academic Year 2025 - 2026**

## **Proposal of M1 tutored project**

### **PROJECT TITLE AND SUMMARY:**

#### **Inventory of tomato-related accessions described as resistant to *Ralstonia solanacearum*, the causal agent of bacterial wilt**

Bacterial wilt is a major limiting disease for tomato cultivation in many countries of the intertropical zone. The pathogen is a species complex (RSSC) divided into phylotypes, and tomato resistance can be effective or not depending on the phylotype involved. Numerous scientific articles, or technical reports from public institutes, describe resistant accessions or varieties, but no recent comprehensive review has been published. It is often difficult to determine whether the described accessions carry the same resistance loci, which RSSC phylotype(s) they confer resistance to, whether these loci have been mapped, and whether molecular markers are available to track them in breeding programs.

The project will consist of compiling and reviewing publications and activity reports related to resistance to *Ralstonia* in tomato and related species. Students will identify the accessions mentioned in these documents and produce a table summarizing all available information for each accession or variety: level of resistance, targeted phylotype(s), genomic position of the resistance locus, available molecular markers, list of publications citing the accession, and the institutions that conducted the corresponding studies.

A particular focus will be placed on the approximately thirty accessions described as resistant and available in the genetic resources collection of the CRB-Leg (GAFL, INRAE-Avignon). The students will be supervised by Bernard Caromel, research engineer at GAFL, and Matilda Frimpong, who is conducting her PhD on this topic, jointly between GAFL in Avignon and the CSIR Crops Research Institute in Kumasi, Ghana.

### **HOST UNIT:**

**INRAE, UR1052, Génétique et Amélioration des Fruits et Légumes (GAFL)**  
**Domaine St Maurice - 67 Allée des Chênes**  
**CS 60094**  
**F-84143 MONTFAVET Cedex**

## **MAIN ACTIVITIES:**

### **Literature and Data Collection**

- Collect and review publications, technical reports, academic sources and scientific articles concerning resistance to *Ralstonia* in tomato and related species.
- Focus especially on works referencing accessions conserved in the CRB-Leg tomato collection at GAFL, INRAE-Avignon.

### **Accession Identification and Data Extraction**

- Extract and list all tomato accessions (varieties, lines, wild relatives) mentioned as tested for *Ralstonia* resistance in reviewed documents.
- Build a summary table and record key information:

For each accession, extract and summarize parameters:

- Level of resistance: Classifications such as moderately resistant or highly resistant.
- Targeted phylotype(s): The specific *Ralstonia* phylotypes (genetic groups) against which resistance was tested (e.g., Phylotype I, II, etc.).
- Genomic position of the resistance locus: Any identified resistance genes or genomic regions linked to resistance, based on QTL mapping or molecular studies.
- Available molecular markers
- List of publications
- Involved institutions: Organizations or research groups that evaluated or reported on each accession.

### **Items to be delivered**

- Complete table
- A written report synthesizing findings and identifying research gaps.

## **CONTACT:**

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