

The Laboratory of Plant Ecophysiology under Environmental Stress offers a 3-year doctoral contract in Montpellier, co-funded by the Occitanie region and INRAE.

**Leaf orientation in grapevine:  
genetic variability and consequences on water use efficiency and  
sensitivity to high temperatures**

**Context and objective of the PhD:**

The heatwave episode of June 28, 2019 in south France particularly affected vineyards. The immediate damage (burns on leaves and bunches) led to irreversible losses. However, differences in sensitivity between grape varieties were noted. The final objective of the PhD project is to identify the grape varieties which are less susceptible to burn and which maintain the best performance in the face of these extreme weather episodes. The research work focuses on the properties of the canopy related to these risks of burns on one part and the water use efficiency for photosynthesis on the other part. In particular, we will analyze the genetic variability observed in the orientation of the leaves, which determines the part of solar radiation intercepted by the leaves and clusters, and which largely modulates the risk of burn. These analyzes will be combined with studies carried out in parallel on the genetic variability of transpiration, which on the contrary cools the leaves, and on photosynthesis which interacts with transpiration to determine the water use efficiency and the resistance of the plants under hot and dry climates on a longer term. The work will include: 1 / an analysis of leaf orientation in a grapevine population developed for a genetic association study; 2 / experimental studies on the risk of burns and the efficiency of water use on a subset of genotypes chosen for their contrasting leaf orientations; 3 / in silico analysis, using an existing model, of the impact of a change in leaf orientation on the risk of burn and on water use efficiency.

**Formation and skills required :**

- Master or equivalent in agronomy or physiology applied to the plant sector
- Proven skills in statistical analysis, quantitative analysis or modeling
- Aptitude for experimental work (including outdoors) in a team
- Writing and communication skills
- English level B2

**Supervision and practical conditions:**

The work will start in winter 2020, within the UMR Lepse (INRAE / Institut Agro-Montpellier SupAgro) under the supervision of Thierry Simonneau (Research Director INRAE, HDR) and Benoît Pallas (Scientist INRAE ). The doctoral student will be registered at the Institut Agro-Montpellier SupAgro and attached to the GAIA doctoral school in Montpellier.

Gross salaries will be about € 1,740 / month (approximately € 1,400 net / month). The doctoral student will have access to the company restaurant for around € 4 / meal as well as many activities offered by the company committee at very advantageous rates.

**Requests for information and applications should be sent by email to Thierry Simonneau ([thierry.simonneau@inrae.fr](mailto:thierry.simonneau@inrae.fr)) before September 20, 2020:**

- Detailed CV
- Cover letter
- Copy of transcripts of the last 2 years rates and ranking
- At least 2 contact references

*Preselected candidates will be contacted for an interview (face-to-face or by videoconference)*