The National Institute of research for agriculture, food and environment (INRAE) is a public research establishment gathering a working community of 12000 people, with 268 research, service or experimental units, located over 18 centers within France. INRAE is one the world leaders in agronomic and food sciences, as well as in plant and animal sciences. Its research aims at building solutions for a multi-performing agriculture, food quality and a durable management of resources and ecosystems.

YOUR MISSION AND YOUR ACTIVITIES

You will be welcomed within the Research Unit BFP ('Fruit Biology and Pathology'), team A3C ('Adaptation of sweet Cherry to Climate Change') at INRAE Bordeaux and within the Research Unit AGAP ('Breeding and Adaptation of Mediterranean and tropical plants'), team SEAPAG ('Evolutive Structure of Citrus, Polyploidy and Breeding') at INRAE Corsica. These two units closely collaborate within the European project (Horizon program) *CrackSense*: 'High throughput real-time monitoring and prediction of fruit cracking by utilizing and upscaling sensing and digital data technologies' (https://cracksense.eu/), initiated in 2023.

CrackSense project, coordinated by Volcani Center (Israel), deals with Citrus, sweet cherry, pomegranate and table grape. Its ambition is to better understand and predict the complex phenomenon of fruit cracking, a major agronomic problem, at the fruit, tree and plot level. At INRAE, we work on sweet cherry and Citrus, on plots that are situated at the Experimental Fruit Tree Unit (UEA), at Toulenne, nearby Bordeaux, and at the INRAE station of San Giuliano, in Corsica, respectively. *CrackSense* project relies on proximal and remote sensing technologies including 3D temperature point cloud data (LIDAR and Thermal Infra-Red) processed on edge unit, as well as on the production of « proxies » for ecophysiological variables (water stress, nutritional status, etc.) from UAV (drone) images. By combining these data with satellite data and other agri-environmental variables linked to the physiological status of trees, the project will produce real-time risk evaluations of fruit cracking at the plot and regional level, in order to improve orchard management and minimize economical losses.

In tight collaboration with researchers and technicians involved in *CrackSense* project, you will be specifically in charge of:

- Organize the measurements to be conducted at both sites of Toulenne and San Giuliano on sweet cherry and Citrus, respectively, both for proximal or remote sensing
- Tightly interact with the project partners responsible for the analysis of thermal images for the data fusion of 3D LIDAR and temperature point cloud, and for the development of prediction models of fruit surface humidity
- Develop site-specific prediction models for ecophysiological variables by using measurements from ecophysiological sensors and images from UAV sensors
- Coordinate the implementation of a French database from surveys conducted at sweet cherry and Citrus growers' orchards dealing with the occurrence of fruit cracking

The periods during which the digital phenotyping activities will be conducted on sweet cherry and Citrus are not overlapping, and you will be asked to spend periods in both experimental sites, near Bordeaux and in Corsica.

You will have as well the chance to participate to different scientific seminars within *CrackSense*, gathering numerous actors from the academic and research sector but also from the fruit growers' world, from Europe and Israel.

THE PROFILE WE SEEK

- Training: Agronomic engineer (MSc level)
- Knowledge: smart agriculture, statistics, digital phenotyping, computer programming (python, R), machine learning
- Experience: agronomic field trial design and follow-up, data analysis linked to remote-sensing
- Skills: Interpersonal skills and ability to work with different groups (researchers, farmers, development and extension services), organizational abilities and rigorous for data collection, traceability, quality and analysis, autonomy

YOUR QUALITY OF LIFE AT INRAE

By joining INRAE, you will benefit from, according to the type of contract:

- Up to 30 days of holidays + 15 days of time off per year (for a full-time contract);
- parenthood support: CESU childcare, services for leisure activities;
- systems for competences development: training, counseling on career orientation;
- social guidance: advice and listening, social grants and loans;
- holidays and leisure facilities: holiday vouchers, special-rate accommodation;
- sports and cultural activities;
- collective restaurant.

✓ **Reception arrangements**	✓ **How to apply**
- UMR BFP – Bordeaux (33) and UMR AGAP – Corsica (2B) - Type of contract: CDD - Length of contract: 33 months - Date of start: from 01/11/2023 - Salary: according to INRAE contractual grid - Housing INRAE San Giuliano: rent of 250€/month	- Send cover letter and CV to José Quero Garcia – INRAE Laurent Julhia - INRAE - By e-mail : jose.quero-garcia@inrae.fr laurent.julhia@inrae.fr - Deadline for application: 30/09/2023