

About INRAE

The “*Institut National de Recherche pour l'Agriculture, l'alimentation et l'Environnement*” (INRAE) is a public research establishment bringing together a working community of 12,000 people, with 272 research, service and experimental units, located in 18 centres throughout France. INRAE is one of the world leaders in agricultural and food sciences, plant sciences and animal sciences. Its research aims to develop solutions for multi-performance agriculture, high-quality food and sustainable management of resources and ecosystems.

Working environment, missions and activities

You will be welcomed in the BioForA research unit (“*Biologie intégrée pour la valorisation de la diversité des arbres et de la forêt*”). This unit of the INRAE Val de Loire centre in Orléans works on the valorisation of forest genetic resources of different tree species for sustainable wood production in a changing climatic context. We use different approaches in physiology and functional genomics, quantitative and population genetics, breeding and conservation methodology. Our aim is to unravel some of the complexities of essential functions of trees (wood production, reproduction or root development) in their adaptation to the environment and their relationship to productive capacity, and to use this knowledge to enhance the genetic diversity available in situ and ex situ gene pools. The unit is involved in a number of collaborative projects and missions with government agencies for the management and production of forest reproductive material.

You will work in parallel on two ongoing research projects at our lab, with complementary profiles. The first is a collaborative H2020 project (2022-2027, “*Harnessing forest genetic resources for increasing options in the face of environmental and societal Challenges*”, <https://www.optforests.eu/>). The second is a French applied research project (2020-2026, Douglas-Avenir: “*Evaluation of an improvement population for Douglas fir and proposals for new seed orchards*”).

In the collaborative H2020 project, you will be in charge of comparing by means of computer simulations different strategies for managing genetic diversity and genetic gain in the context of artificial selection that are operationally simple, quick to implement and inexpensive. These strategies will be inspired by different typologies corresponding to different species and their demogenetic, ecological, environmental and economic contexts. The definition of these typologies will be carried out in collaboration with several European partners involved in the project, with data and experience from their respective species and programmes. These strategies will be compared with a reference strategy based on optimal management of diversity and genetic gain for maximum efficiency over the short and long term. You will use the simulation tools and codes already available in our laboratory (scripts using AlphaSimR and MOPS), which you will be able to improve with new developments. These tools use virtual genomes with a finite number of loci and a set of hypotheses about the genetic architectures underlying the traits of interest.

In the Douglas-fir project, you will be in charge of several quantitative genetic analyses for the evaluation of forest reproductive material, the use of genomic information (50K SNPs) in combination with the above quantitative genetic models, and the application of the knowledge gained in the collaborative H2020 project on optimal management of diversity to the practical conditions of forest breeding.

The results of these simulation and applied works will be the subject of several scientific publications, at least one general and one for each type of major case study, for the collaborative project, and at least one more concerning the Douglas breeding program.

The proposed term is 24 months and the start date can be immediate or negotiable up to Early 2025.

Special conditions of activity:

Work in Orléans (45, Loiret), mainly with computers. Easy access to lab by public transport (tram and bus). Business trips to other places in France and Europe for meetings and workshops.

When you join INRAE ...

Depending on the type of contract, you will be entitled to:

- up to 30 days' holidays + 15 days' RTT per year (for full-time employees)
- up to 3 fixed teleworking days per week
- a contribution towards public transport costs, or a sustainable mobility allowance
- support for parenthood: CESU childcare, leisure benefits, etc.
- skills development schemes: training, career guidance, etc.
- social support: counselling and listening, social assistance and loans
- holiday and leisure services: holiday vouchers, accommodation at preferential rates
- sports and cultural activities
- access to the canteen

Training and skills required

- PhD, with recommended training in genetics, quantitative or population genetics, in data analysis and modelling applied to biology
- Other desirable knowledges: plant breeding, genetic improvement, programming and modelling in R, bioinformatics and familiarity with a Linux environment and computing clusters
- Good command of written and spoken English

How to apply

Send a motivation letter and CV to Leopoldo Sanchez-Rodriguez (Leopoldo.sanchez-rodriquez@inrae.fr)

Deadline for applications: 31 October 2024