Post-doctoral offer - 18 months - NV2 project (starting June-July 2019)

Background: the NV2 project
The objective of the NV2 project (October 2016 to September 2020) is to enable supplier companies in the sector of wine production to provide products and services that enable winegrowers and winemakers to meet global expectations in terms of taste.
To achieve this, the NV2 project consortium, made of 3 small and medium-sized companies (ITK, Frayssinet,Nyseos), a large industrial group (Lallemand) and 4 research units from INRA/University of Montpellier (SPO, LEPSE, SYSTEM, MISTEA), aims to propose a new integrated management of nitrogen inputs throughout the grape production and winemaking process.
The specific goal of INRA (MISTEA), together with the companies ITK & Frayssinet, is to examine the effect of the type of organic fertilization and biostimulation applied to the vine on grape maturation dynamics (anthocyanins, sugar content, acidity). To this end, experiments have been conducted since 2016 on various vineyard plots. Longitudinal data acquisition during one or two viticultural seasons will make it possible to develop algorithms for estimating the temporal evolution of grape quality parameters in function of the nitrogen supply and bioclimatic variables (temperature, water availability, solar radiation). Model and data on nitrogen dynamics in the soil and in the various plant organs will be available to complete the longitudinal study of the grape quality and to improve the algorithms.

Post-doctoral fellowships

Main mission: development of a model for the dynamic of grape quality
Whereas the modelling of photosynthesis or water status of grapevine is fairly well established, the dynamics of accumulation of quality parameters such as anthocyanins and aromatic precursors are still a matter of investigation and are not described by extensively validated models.
The post-doctoral student will evaluate the existing knowledge and models using data collected during the project’s field seasons and adapt or propose models that will consider nitrogen constraints.
The post-doctoral researcher will develop a mathematical dynamic model which takes into account agronomical knowledge and bioclimatic variables and seasonality. Some part of the modelling will need to use statistical learning. The model will be evaluated using field data and run using different scenarios of nitrogen supply to give information on the ripening dynamics in different conditions. This model could then be coupled with a nitrogen status model for grapevine which will be developed in the NV2 project.

Secondary missions:
- Create a workflow from data to model and simulation. Suggested languages are Python or R
- Create R-functions (eventually a package) for statistical learning
- Valorization through papers and conferences are expected

Required profile:
PhD in Agronomical Sciences and Modelling.
Skills in mathematical modelling and simulation.
High programming knowledge, in R and Python languages.
Interested by teamwork and transfer.

**Supervision and reception of the post-doctoral student**
The post-doctoral researcher will be co-supervised by the research unit MISTEA (INRA) and the company ITK. He (she) will also collaborate with the research Unit LEPSE (INRA).
The post-doctoral researcher office will be based partly at MISTEA (Montpellier) and partly at ITK (Clapiers) (periods to be defined).

**Period of post-doctoral fellow:**
From June-July 2019 to December 2020.

**Remuneration:**
Based on the threshold set by French administration and adjusted to the post-doctoral experience of the applicant: 2338 €/m (< 2 years of experience) to 2511 €/m (2 to 5 years of experience).

**Contacts:**
Damien Fumey for ITK (damien.fumey@itk.fr) and Benedicte Fontez for INRA-MISTEA (benedicte.fontez@supagro.fr).