

## Postdoctoral position on crop modelling

### Development of a crop submodel as part of a Serious Game on AgroEcology

#### Context :

European agriculture is facing many challenges, among which the production of food in sufficient quantity and quality, the generation of enough added value to ensure a decent living to farmers, the contribution to employment in Europe (over 22 million people working in agriculture in 2013) and the reduction of detrimental agricultural impacts on the environment (air, water, soil, biodiversity) and human health.

Defined as “the study of the interactions between plants, animals, humans and the environment within agricultural systems”, Agroecology is a holistic approach that takes into consideration natural ecosystems to maintain or even increase yields while respecting natural cycles of water and nutrients, preserving the soil, protecting biodiversity, water quality, and therefore improving the sustainability of agricultural systems. Agroecology is seen as a very pertinent option to reorient European agriculture in order to answer EU major challenges, and is supported by a growing number of local, national and EU regulations.

But we need to build awareness and better teach the concepts of agroecology to the next EU generation of professionals in the field of agriculture, *i.e.* students and active agricultural professionals. Innovative tools are urgently needed to help deliver multidisciplinary, high quality and attractive training on agroecology to students and agricultural professionals.

#### Project description :

The project aims to develop a serious game for digital learning on agro-ecological concepts, responding to 3 main objectives:

- Providing a multidisciplinary understanding of agroecology by linking plant, animal, soil, ecology, economics and social sciences into a single model.
- Putting the players in a situation of active learning and experimentation. The use of computer modelling will allow players to test various options among a panel of actions that a farmer could choose. They will discover the multiple consequences of AE management practices on various aspects farm (productivity, landscape, revenue, etc.). This inductive pedagogical approach helps the player access a systemic thinking on agroecology.
- Providing practical knowledge about a large diversity of agroecological practices, their effects in different contexts and how to combine them. Players will learn through pedagogical summary sheets related to each management action.

The serious game is first aimed at higher education students, through integration of the game within cursus. It will also be made freely available to a wide audience, through online platforms.

### **Job responsibilities and tasks:**

The job holder will be in charge of:

- contribute to a review of agro-ecological concepts associated to crop and their impacts crop production and other agro-ecosystem services
- contribute to the conception of a global conceptual agro-ecological serious game
- develop the crop sub model part of the serious game
- contribute to the tutorial and game specification writing

### **Required education, experience and skills:**

Applicants must hold a PhD (since less than 10 years – Eu or int. postdoc profile) or an engineering degree (Belgian profile), ideally in link with crop modelling and/or agronomy and/or agro-ecology.

Furthermore, applicants must:

- have a strong analytical background to work with meta-analysis and multi-criteria approaches,
- have a good knowledge of standard statistical methods,
- have a good knowledge of programming (any language),
- show autonomy in conducting research,
- have a proven ability to work in network with a range of scientists,
- have good English writing and speaking skills.

### **Location:**

The job holder will be based at the University of Liege, Gembloux Agro-Bio Tech faculty, located in 5030 Gembloux, Belgium ([www.gembloux.ulg.ac.be](http://www.gembloux.ulg.ac.be)).

He/She will work within the Crop Science Unit of the AgroBioChem Department.

### **Collaborations:**

The job holder will be under the direct supervision of B. Dumont, with interactions M. Dufrêne and H. Soyeurt (GxABT teacher/researcher)

The job holder will be involved in a project including teaching and research institute from France (AgroCampus Ouets, ESA Angers and Oniris), Italy (University of Bologna) and Poland (Krakow University of Agriculture).

### **Contract duration and salary:**

Fixed-term position of ~12 months. No possibilities of extension on this project. The annual salary (gross or net, depending on the profile) will be ~40-45.000eur.

Two profiles are accepted:

- EU or international postdoc (non-Belgian) can apply for a full-time job
- Belgian postdoc or research engineer can apply for a part-time job (half-time or 3/5)

**How to apply:**

Applicants must submit a complete application package by email to Benjamin Dumont ([benjamin.dumont@uliege.be](mailto:benjamin.dumont@uliege.be)) including (1) a curriculum vitae , (2) a copy of the most important recent publications, (3) statement of motivation, and (4) names, addresses, phone numbers, and email addresses of at least two references.

The position is available from 01/05/2018 and will remain open until filled with review of applications and interviews. Salary follows national directives regarding postdoc fellowships, including full social and health benefits (~40.000 to 45.000 €).

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