

## **Senior lecturer in applied entomology for plant protection**

Establishment: Institut Agro RENNES-ANGERS

DISCIPLINE: ENTOMOLOGY, ECOLOGY OF PLANT-INSECT  
INTERACTIONS

CNECA no.2 - ENVIRONMENT, ORGANISMS, POPULATIONS

SESSION 1

RENOIRH no.: A2ACO00098

### **Work environment**

Since 1 January 2020, Institut Agro Rennes-Angers (national school of agronomic, agri-food, horticultural and landscape sciences) has been a part of Institut Agro (French Higher Education Institution in Agriculture, Food, Horticultural and Landscape Sciences), a new major establishment for agriculture, food and the environment under the authority of the French Ministry of Agriculture.

Located in the midst of Europe's leading agricultural and food-processing region, on two training and research campuses in Rennes and Angers, Institut Agro Rennes-Angers has 130 expert lecturers and researchers working with 2,000 students enrolled in four engineering courses and other programmes from bachelor's degree to doctorate (110 doctoral students, co-accreditation in four doctoral schools). Institut Agro Rennes-Angers conducts academic and applied research in close partnership with INRAE and transfer and development activities in conjunction with three competitive clusters (Mer Bretagne, Végépolys and Valorial).

The lecturer in Applied Entomology for Plant Protection will be part of the Ecology-Botany-Entomology Educational Unit (UP EBE) in the Ecology Department at Institut Agro Rennes-Angers, part of the Institut Agro. The UP EBE has 8 research lecturers, including 2 entomologists, and 4 technical and management staff on the Angers campus. They will carry out their research within the Ecology and Insect Genetics team of the UMR IGEPP1. This team includes 24 researchers and lecturers and 14 permanent technical staff from Institut Agro Rennes-Angers, the University of Rennes and INRAE (Le Rheu site).

The Angers campus of the Institut Agro Rennes-Angers is located on the Belle Beille university campus (<15min by bike from the city centre), in a pleasant environment and in the middle of the Vegépolys Valley competitiveness cluster, which brings together companies, research centres and training centres in plant science. This hub includes the nearby INRAE, the University of Angers, GEVES, ANSES and technical institutes such as FNAMS, ITEIPMAI, AREXHOR Pays de la Loire and Plante & Cité.

### **Context of the position**

The negative impact of intensive agriculture and pesticides on the environment, biodiversity and human health requires an agro-ecological transition to redesign farming systems. This paradigm shift requires innovation to develop systems that should be less dependent on plant protection products, to propose new alternative solutions and to adapt technical processes. One of the main innovation approaches for designing new systems, strategies, facilities and new biocontrol solutions is chemical ecology and manipulating the behaviour of insect pests and natural enemies, particularly in the horticultural context (arboriculture, market gardening and covered crops) and in urban areas. However, current solutions are generally inconsistent in their effectiveness. A better understanding of the link between odour perception and insect behaviour is needed, to better control the conditions of effectiveness and to identify new strategies and solutions.

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<sup>1</sup> IGEPP: Institute of Genetics, Environment and Plant Protection

## **Teaching duties**

They will teach in the fields of the biology of invertebrate organisms (mainly insects), applied ecology for plant protection, cropping systems design and agroecological and biocontrol methods.

The lessons will be taught as part of the engineer curriculum in Horticulture-Landscape at undergraduate degree level, in general biology, ecology, entomology, plant protection courses that are currently being reformed. They will be involved in several multidisciplinary courses and integrative activities on the development of the scientific and project approach, biodiversity, environmental issues and the design of sustainable farming systems. Teaching methods will combine lectures, seminars and practical work with more innovative forms of teaching, project management, personal monitoring and internship assessment. They will be able to operate on the same themes at the Licence pro level in the Plant Health Management course, co-accredited with the University of Angers.

They will be involved in several Master's level courses of excellence in the field of plant protection, such as the Plant Protection and Environment (PPE) engineering specialisation, to which several international courses are linked, in particular the Plant Protection and Environment in Horticulture (PPEH) course, as well as the Plant Health Management course of the Master's degree in Plant Biology co-accredited with the University of Angers. In these courses, they will be involved in 'scientific basis of biocontrol', 'plant resistance to diseases', 'physical and chemical protection' and 'alternative control methods' modules. They may also be involved in the 'Plant Health' international summer school.

The appointed lecturer will gradually take responsibility for coordinating and leading teaching modules from L1 to M2 level, with the support of the teaching unit members. They will take part in the development of the content and organisation of these courses, particularly as part of the reform of the L1-M1 Horti-Paysage course currently underway, to take better account of current global issues, to adapt the teaching to new audiences, and to open up to the international market. He/she will teach most of their courses in French and will be able to develop courses in English or other languages in the international training programmes in place or to be developed (semester in English, Erasmus Mundus Master's degree, summer university, intensive European course, joint diploma, etc.). The appointed lecturer will be able to propose and design new courses in collaboration with other teachers in the Ecology Department or other departments, particularly in relation to his/her field of expertise (training through research).

## **Research and transfer assignments**

The Lecturer recruited will develop research in the chemical ecology of insect pests and/or their natural enemies (predators or parasitoids). He/she will focus more particularly on aspects of sensory ecology, to understand the mechanisms of perception and integration of olfactory and/or gustatory signals in insects, and the consequences on their behaviour. He/she may also touch on aspects of ecophysiology, neurobiology, behavioural and evolutionary ecology. This research will have applications in the design of cropping systems that manipulate the olfactory environment to disadvantage pests and/or favour their natural enemies, or in the identification of innovative approaches to biocontrol solutions.

Their skills will strengthen the potential of the UMR IGEPP in the ecology of plant-pest-natural enemy interactions in agroecosystems. The successful applicant will be integrated into the "chemical ecology of plant-insect interactions" and "biological regulation and agroecological management of insect pests" topics of the EGI team. The appointed teacher-researcher will enjoy a stimulating environment, regular scientific guidance, the transmission of skills and techniques, an established scientific network and on-site access to infrastructures (climatic rooms, laboratory, greenhouses, insect rearing facilities) and specific experimental devices (electroantennography, olfactometry, electropenetrography) enhanced by the shared technical platforms of the SFR Quasav<sup>2</sup>). They will be able to take part in large-scale collaborative projects currently underway (e.g., PPR CapZéroPhyto) and will help to set up new research projects, with the creation of consortiums that may include players in the agricultural sector (companies, technical institutes, etc.). They will help to supervise trainees, contract workers and PhD students.

## Research profile

This permanent position is for a scientist with research experience in the field of chemical ecology of arthropods. He/she should have a thorough understanding of the theoretical basis, the applications in the field of plant protection and the modern methods of research and data analysis. Significant scientific output in the field is required. National and international collaborations will be appreciated.

For their teaching involvement, knowledge in entomology, plant protection, general, evolutionary and behavioural ecology will be considered an advantage. A first experience in teaching, designing courses, seminars or practical work, supervising internships and/or student projects will be welcome.

## For further information

- On the teaching: Dr Valéry Malécot, deputy head of the Ecology department, [valery.malecot@agrocampus-ouest.fr](mailto:valery.malecot@agrocampus-ouest.fr)
- On the research: Dr Sylvia Anton, joint coordinator of the Ecology of Interactions theme of the EGI team of the UMR IGEPP, [sylvia.anton@inrae.fr](mailto:sylvia.anton@inrae.fr)
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