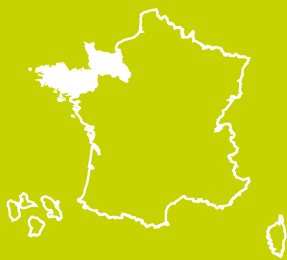


Inra
The Research Centre of Rennes
Brittany-Normandy



Contact

Inra/Agrocampus Ouest/Rennes 1 University
Joint Research Unit
Institute for Genetics, Environment
and Plant Protection
Domaine de la Motte
BP 35327
35653 Le Rheu Cedex
Phone: +33 (0)2 23 48 58 08
dirigepp@rennes.inra.fr
www.rennes.inra.fr/igepp-eng

Joint Research Unit

Institute for Genetics, Environment and Plant Protection – Igepp Unit

Research conducted at IGEPP contributes to the development of innovative and sustainable methods or plant production and protection. For this, IGEPP aims at describing, understanding and predicting biological, ecological and evolutionary processes existing in agro-ecosystems. They take into account the complexity of these systems, at various scales such as the individuals, populations or communities. Additionally, agroecology approaches are carried out (i) to develop integrated and complementary approaches for plant protection; (ii) to develop agroecology approaches for plant protection and culture systems; (iii) to develop sustainable plant resistance approaches; (iv) to develop sustainable agronomical approaches; (v) to understand the biodiversity and genetics of organisms living in agroecosystems; (vi) to use knowledge on evolution and adaptation of plants, plant pests and their natural enemies; (vii) to decipher the responses to abiotic and biotic stresses of plants, plant pests and their natural enemies.

These researches are performed on major crops (wheat, oilrape seed, peas, potato), vegetables (carrot, cabbage, beet, etc...) and model species (*Arabidopsis thaliana*, *Medicago truncatula*). They also consider the wide variety of organisms interacting with the plant (pathogens, pests or beneficials) such as viruses, bacteria, fungi, oomycetes, protists, nematodes and insects.

Three main research fields

Diversity and evolution of plants and associated organisms

These researches aim at deciphering and predicting adaptive and evolutionary processes taking place in agro-ecosystems, at the genome and interacting population scales.

Plant responses and associated organisms adaptation to biotic and abiotic stresses

It describes the genetic and molecular determinants of plant responses to a combination of multiple stresses, as well as to follow how pathogens, pests or beneficials evolve in a changing and stressing agronomical environment.

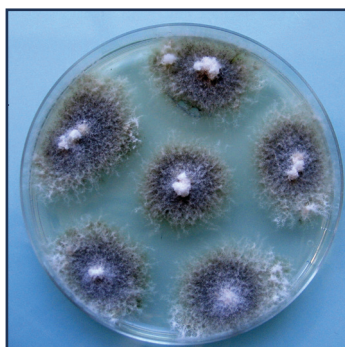
Functioning of interacting communities in agro-ecosystems

By studying epidemics dynamic, the objective is to describe the functioning of agro-ecosystems to design novel efficient and sustainable production systems which consider the farmers needs.

Five research teams

Biodiversity and Polyploidy

To maintain, describe and use of natural biodiversity (relying on the Biological Genetic Resource Center on Brassica and Solanum: BrACySol) in plant breeding programs studying the genetic mechanisms responsible and involved in the regulation, the recombination and the speciation of two polyploid species: wheat and oilrape seed.



Executive

Denis Tagu, director

Skills

- Genetics, Genomics, Bio-Informatics, Cytogenetics
- Biochemistry, Plant Physiology
- Populations Genetics, Evolutionary Biology, Ecology, Epidemiology, Phytopathology
- Agronomy, Statistics and Modeling

Some figures

- 264 people including 71 research scientists and professors, 116 technicians
- 15 professional scientists and technicians
- 24 PhD students
- 5 research teams
- 2 joint technological units
- 6 technical platforms
- 5 locations: Le Rheu and Rennes (35), Ploudaniel (29) and Angers (49)

Sustainable novel crop material

To breed winter wheat varieties adapted to low input and organic farming.

Ecology and Genetics of Insects

To understand how insect pests of crops and vegetable as well as their natural enemies (predators and parasitoids) evolve and adapt to anthropogenic changes, interact with biotic factors of the environment and participate to agro-ecosystems trophic networks and to disease transmission. The team develops decision support tools and proposes sustainable and integrated insect pest protection practices.

Resistance and Adaptation

To study plant – pathogen and pest interactions to:

- Identify the genetic factors involved in plant resistance or in plant/canopy architecture in order to limit epidemics and to understand plant response to infections in various biotic and abiotic environments;
- Assess the evolutionary processes of pest and pathogen populations and associated microbial communities and their adaptive response under the constraint of the plant selective pressure;
- Understand the epidemics dynamic either at the field or at the agroecosystem scales.

Les connaissances opérationnelles de l'équipe favorise le développement de variétés résistantes permettant de gérer les pressions de sélection exercées sur les populations de bioagresseurs et contrôler durablement le développement d'épidémies de maladies aériennes ou racinaires

Yield under Abiotic Challenges

To study the nitrogen use efficiency in oilseed rape grown under abiotic constraints as well as modalities of nitrogen and carbon allocation and distribution in order to optimize the seed oil content, while ensuring the quality of the final product for food or industrial uses.

Training

Scientists are involved in a large number of training at the University of Rennes 1, at Agrocampus Ouest, for students in Licence-Master PhD and in the training of engineers students. They are in charge of five master specialities.

A research in partnership

The IGEPP UMR is involved in many projects funded by the National Agency of Research and in the "Investments for the Future" programs (Rapsodyn, Peamust, Genius ...). Applied objectives of IGEPP rely on a strong and historical partnership with professionals involved in plant selection and in the survey of epidemics of plant pathogens in Brassicas, potato, wheat, legumes and vegetables. More than 15 employees of these partners are working in our Institute. Two examples illustrate this partnership with professionals: the Joint Technological Units InnoPlant in 2012 with the FN3PT and PISOM in 2013 with the Terres Inovia/Univia.

