

Improvement of a crop model predictability for soybean adaptation to the Hauts-de-France region

Keywords: agriculture, agronomy, genotype x environment interactions, intraspecific variability, phenotypic variability, plant ecophysiology, crop model

Context

France, and more broadly Europe, are in a situation of significant deficit regarding the production of vegetable proteins. Nearly 90% of European needs are imported, and France is only 50% sufficient. In order to limit a detrimental dependence on the main producing countries, it is necessary to promote the development of cropping systems integrating these crops with multiple advantages. Leguminous protein crops, in addition to crop rotation diversification, present advantages that are in line with the current agricultural issues: reduction of inputs (nitrogen and phytosanitary), good added value and positive externalities (interruption of weed cycles, relocation and/or revitalization of activities within territories, etc.). Among these, soybean is one that requires very few inputs, especially phytosanitary, and could be one of the keys to revitalizing the vegetable protein and agro-economic diversification of our territories. However, surfaces of soybean remain low in France and are concentrated in the South-West and South-East regions. The genotypes currently on the market remain very little adapted to the North regions, and the required agronomic practices to maximize their potential need to be specified. Efforts still have to be made in order to optimize territorially, technically and from an organizational point of view the spreading of soybean crop. The use of crop models could be a powerful technical support for the evaluation of soybean adaptation to our northern regions.

Internship objectives

This internship is part of the research project of the UniLaSalle Plant Breeding Chair which aims to identify on a pluriannual basis the agro-climatic determinants of soybean adaptation to Northern France especially through the calibration of a crop model. It will focus on the validation of a first model calibration. It will include the acquisition of key phenotypic data (phonologic and morphologic) needed for the model validation (development stages, yield, aerial biomass, leaf area, photosynthetic activity). A panel of very early soybean maturity genotypes (000-00) will be grown under contrasting conditions (sowing date and irrigation).

Intern missions

- Discovery and learning about the crop model software;
- Set-up and follow-up a multi-varietal experimental trial;
- Sampling of soils/plants at key stages of plant development;
- Acquisition of vegetation data in the laboratory (biomass, leaf area, etc.);
- Confronting experimental measurements with crop model simulations;
- Proposal for the improvement of the calibration
- Redaction of a scientific report.

Relevant skills

- Master degree or equivalent in Agriculture/Agronomy with solid knowledge in agronomy and/or plant ecophysiology;
- Experience in the implementation and/or follow up of experiments will be appreciated assets;
- Other skills such as sense of human relationships, fondness for interdisciplinary and ability to work independently are essential;
- Driving license is required.

Internship conditions

Research unit: AGHYLE (UP.2018.C101), SFR Condorcet FR CNRS 3417, UniLaSalle Beauvais campus, 19 Rue Pierre Waguet, 60026 BEAUVAIS Cedex France;

Supervision: Guérolé BOULCH (Associate professor in plant breeding and ecophysiology) and Bastien LANGE (Associate professor in plant genetics and ecology);

Internship period: Mid-March/April 2021 to September/October 2021 (6 months);

Indemnities: According to 2021 base; accommodation on the UniLaSalle Beauvais campus is possible according to the applied fees;

On-site benefits: Multiple services available on campus (100 student associations, gymnasium, fitness center, university restaurant, etc.)

Contacts

Applicants are invited to send a motivation letter and resume to Chloé ELMERICH (chloe.elmerich@unilasalle.fr) and Guérolé BOULCH (guenole.boulch@unilasalle.fr) before November 15, 2020.