**Job Advertisement Agroscope**

**Title**
PhD-project: The compost microbiome and its utilization to control soil-borne diseases

**Introduction**
Do you want to shed light on the hidden world of compost microbes and their plant-beneficial effects?

Root diseases can cause substantial yield losses and are very difficult to control. Compost application can suppress soil-borne plant diseases and microorganisms are essential for this trait. However, the ability of disease suppression strongly varies among different composts or may even be absent. The cause of this variation is unknown and means to predict or mitigate it are missing. For the prediction of disease suppression of a compost before its application, a diagnostic tool based on indicative microorganisms would represent a huge leap forward. Such a tool would allow to increase quality and value of compost for agricultural use and promote the wider use of this recycling product for sustainable crop protection. Therefore, the goals of this project are: 1) a detailed inventory of the microbiome of different composts, 2) a validated list of microorganisms that associate with disease suppression of composts to develop a diagnostic tool for this trait, 3) isolation and testing of microorganisms potentially involved in this trait, and 4) strategies to foster indigenous or add suppressive microorganisms during the composting process.

These goals will be addressed using high throughput sequencing (HTS)-based metabarcoding of the compost microbiome, functional assays using pot experiments, as well as classic microbiological isolation techniques and functional tests on plates.

This 4-year PhD-Thesis-Project is based on an established collaboration of the “Molecular Ecology” group at Agroscope and the “Crop Protection and Phytopathology” group at FiBL. Therefore, the PhD project will be conducted at both institutes, i.e., the DNA based lab work and sequence analyses at Agroscope and the pot experiments and isolations will be predominantly performed at FiBL. Through this project the PhD student will gain a comprehensive understanding of molecular and classic microbiology, from design of pot experiments to lab work as well as data analyses.

**Tasks**
- Development and adaption of in situ and in vitro bioassays for disease suppression
- Taxonomic identification of microorganisms indicative or involved in disease suppression using HTS followed by isolation techniques
- Bioinformatic and statistical analyses of metabarcoding data as well as adaptation and development of analytical pipelines and R-codes
- Presentation of research findings at national and international conferences
- Publication of the results in scientific journals

**Requirements**
- MSc in microbiology, ecology, or agronomy with a strong interest in molecular biology and molecular genetic analyses
- Experience with statistics (R) and UNIX based programs
- Achievement-oriented, open-minded personality with a spirit for teamwork
- Flexibility to work at two different institutes
- Knowledge of two official Swiss languages, good knowledge of spoken and written English are required.

**Information about Agroscope**
Agroscope is the Swiss federal centre of excellence for research in the agriculture and food sector. Its researchers carry out their work at a number of sites in Switzerland. Headquartered in Bern-Liebefeld, Agroscope is attached to the Swiss Federal Department of Economic Affairs, Education and Research EAER. The research group Molecular Ecology focuses on genetic analyses of microorganism, insects and plants in agricultural contexts. Main interests are the development and application of genetic markers to study genetic diversity, the investigation of biological soil quality, as well as the exploration of ecological aspects in microbial pest control.
The Research Institute of Organic Agriculture Switzerland (FiBL) is one of the world’s leading organic research and technology transfer centres dedicated to sustainable agriculture. FiBL’s strength lies in its interdisciplinary research, innovations developed jointly with farmers and the food industry, solution-oriented development projects and rapid knowledge transfer from research into practice. The Crop Protection - Phytopathology group within the Department of Crop Sciences deals with all aspects of the control of plant diseases, ranging from indirect (e.g. cultural practices, resistant varieties, functional biodiversity, soil fertility) to direct crop protection measures (e.g. biocontrol organisms, plant protection products compatible with organic farming).

We offer an attractive project and work environment in multidisciplinary research teams as well as thorough initial training. Agroscope and FiBL have excellent research facilities with well-equipped laboratories, greenhouses and climate chambers. You will enjoy flexible working hours and good employee benefits. You will be enrolled as a PhD student at the ETH Zürich.

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<th>Place of work</th>
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<td>Pay grade</td>
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Contact

If this position interests you and you fulfil the profile of requirements, we look forward to receiving your online application here: human.resources@agroscope.admin.ch, Ref.nr. 46706.

Online applications must consist of a single PDF containing an application letter, your CV, a copy of certificates/Diplomas (MSc &BSc) and contact details of two references. The position remains open until filled.

For further information, you may contact: Dr. Johanna Mayerhofer, research scientist in the group Molecular Ecology, phone +41 58 465 71 81, johanna.mayerhofer@agroscope.admin.ch (Do not send applications to this e-mail).

Application deadline: 25.08.2021. Start: 1 October 2021 or by arrangement – Duration: 4 years.