



securing tomorrow's resources

BSc or MSc thesis “Development of a molecular resistance assay for oat smut”

Institute for Breeding Research on Agricultural Crops - based in Groß Lüsewitz

The project

The share of organic oat cultivation area has grown continuously to now approx. 33%, which is due to an increasing demand and positive crop rotation effects of oats. Loose smut of oats (*Ustilago avenae*) is an important disease in organic oat farming and especially organic oat seed production. The most effective option for avoiding losses is to cultivate resistant varieties. Loose smut of oats is a seed-borne disease that develops without any visible symptoms until panicle emergence, which makes classical resistance testing a lengthy process. In addition, there is a risk of contaminating neighbouring experiments with *U. avenae* spores. To solve this issue, a molecular resistance assay that quantifies the fungal DNA within the plant before spore development using qPCR will be established.

Research activities and methods

The activities of the current project involve (but are not limited to)

- DNA isolation from infected oat samples
- Establishment of a qPCR protocol for quantifying *U. avenae* DNA in planta
- Observation of fungal development in the plant using fluorescence microscopy
- Comparison of qPCR results with classical resistance assay results
- Analyses of the collected data

Qualification and interest

We are looking for candidates with the following qualification and interest:

- Enrolled in a graduate program in biological or agricultural science, biotechnology or related fields.
- Experience with molecular laboratory methods.
- Interest in microscopy, plant cultivation and plant diseases.
- Motivation and good work ethics.

Our offer

- a research oriented BSc or MSc thesis with practical relevance for organic oat production at the Institute for Breeding Research on Agricultural Crops, which is part of the Julius Kühn Institute, the Federal Research Center for Cultivated Plants.
- an international and multi-disciplinary group with expertise on biostatistics, quantitative genetics, plant genomics, molecular genetics, plant breeding, bioinformatics and plant physiology working on current topics of breeding methodology and crop genetics.
- an enabling working environment and friendly colleagues, state-of-the-art plant cultivation facilities, laboratories and an experimental field.
- Our institute can be reached within 17 minutes by train from Rostock central station.

More information

For further details on project description and application, please contact

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