ETH zürich

Molecular Plant Breeding

Master thesis project

Detection of Italian ryegrass (*Lolium multiflorum*) introgressions in perennial ryegrass (*L. perenne*)

Background

Seedling root fluorescence (SRF) under UV light is an established method in seed purity analysis for the detection of *L. multiflorum* (Lm, fluorescent) seed contamination in *Lolium perenne* (Lp, non-fluorescent). Lm contamination is problematic because of the reduced forage quality and persistence of Lm compared to Lp. Although considered separate species, Lm and Lp are cross-compatible and hybridization is difficult to avoid due to the abundance of Lm pollen in the air. The FLUORES project aims to investigate whether SRF can be adapted for breeding to identify hybridization of Lm within Lp breeding material. This MSc thesis will investigate the relationship between phenotype (*i.e.* presence vs. absence of awns, multiple vs. single flowering, ...) and SRF or genetic markers. This will allow an assessment of the suitability of SRF or genetic markers for use in breeding to detect and eliminate hybridizations in Lp breeding populations.

Objectives

Assessment of the correlation between phenotype, seedling root fluorescence and genetic markers within *L. perenne* material hybridized with *L. multiflorum*.

Research Approach

- Phenotyping of spaced plants of *L. perenne* showing varying levels of hybridisation with *L. multiflorum* in the field
- Application of species-specific genetic markers
- Correlation analysis between phenotypic data, SRF and genetic markers

You will learn

Design of experiments – Field phenotyping of grass plants – Testing of molecular markers – Statistical analyses

We are looking for

Master's students interested in plant breeding. The experiments will be conducted at Agroscope Reckenholz (field) and with the help of the Swiss Plant Breeding Center at FiBL in Frick (lab).

Contact

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