Bachelor or Master thesis BIOVIT 2022/23

Topic (Norwegian):
Effekten av temperatur på falltall og α-amylase-aktivitet i hvete

Topic (English):
The effect of temperature on falling number and α-amylase activity in wheat

Summary
Falling number is an important quality measure in wheat, indicating whether the flour is suitable for most baking processes. One of the genetic factors influencing the falling number is the difference in sensitivity to late maturity α-amylases (LMA). In some genotypes, the sensitivity is mostly latent, but the unfavorable sensitivity can be passed on. However, cool temperature shock can be used to trigger LMA expression and unveil the latent sensitivity. We have identified Norwegian breeding lines suspected to harbor LMA sensitivity. In this topic we are looking for a student to be involved in field, greenhouse, and laboratory testing of falling number and LMA activity and validate genetic markers. For the coming field season (2023) we will also be able to test the breeding lines under two different temperature regimes in polytunnels to study the effect of temperature on the buildup of seed dormancy.

The objectives of this project are to (1) evaluate variation in falling number caused by late maturity alpha-amylase based on field trials; (2) identify genetic loci responsible for the trait using genome wide association mapping (3) evaluate the effect of temperature on the LMA activity in the polytunnels as well as under controlled temperatures in the greenhouse.

Subject area (keywords): genetics, seed dormancy, pre-harvest sprouting, QTL-mapping

Language thesis: English

Bachelor or Master thesis: Master thesis

Credits: 60 ECTS

Project/company:
SproutResist (NFR 321436): Genomic-based breeding technology for the improvement of pre-harvest sprouting resistance in spring wheat under Norwegian climate

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