Internship Opportunity: Data Collection and Modeling of Perennial Grain Non-Structured Carbohydrates Dynamics

Location: **Aarhus University**, Campus Viborg, Blichers Allé 20, DK-8830 Tjele, **Denmark**

Duration: 3–4 months (12–16 weeks)

Period: May – August 2026 (exact dates flexible)

What are Perennial Grains?

Perennial grain (PG) crops serve as sustainable alternatives to annual cereals in response to current climatic challenges. These crops produce edible starchy seeds and forage biomass over multiple growing seasons from a single establishment. This multi-year lifespan enables PG systems to provide essential ecosystem services, such as soil carbon sequestration and reduced nutrient leaching, while diversifying income sources for farmers. Intermediate Wheatgrass (*Thinopyrum intermedium,* IWG) represents the first food-grade perennial cereal undergoing active domestication. However, the unique physiology of these crops, particularly their reliance on belowground storage organs for multi-year survival, remains insufficiently represented in current crop models.

Project Background

The **Department of Agroecology** is developing a process-based model for **IWG**. Field studies demonstrate that IWG storage organs contain large reservoirs of **non-structural carbohydrates (NSC)**. These reserves provide the resources necessary for survival and regrowth both during stand establishment and after harvesting.

Current perennial grain models, however, omit the translocation of stored carbon from roots to aboveground organs. This structural gap limits the ability of existing frameworks, such as APSIM, to represent fundamental perennial traits accurately. Our research aims to bridge this gap by developing a dedicated storage organ module that simulates NSC recharge and remobilization, driven by environmental factors like photoperiod and/or management practices like forage harvesting.

Your Role and Responsibilities

The intern contributes to the empirical research necessary to quantify dynamic parameters for this new model, especially on its storage organs. Primary responsibilities include:

- **Field Work and Sample Processing:** You will perform field sampling of topsoil roots and

biomass (Driving license is an advantage). Responsibilities also include root washing and hot-air drying of collected plant materials.
- **Laboratory Analysis:** You will conduct laboratory work to determine NSC concentrations.
- **Statistical Analysis**: Hypothesis testing, Time Series Analysis
- **Basic GIS and Remote Sensing Skills:** The role involves extracting information from UAV (drone) images using dedicated software (QGIS, R). An advantage but not a must.
- **Scientific Reporting:** You will synthesize your findings into a formal scientific report.

Candidate Profile

- **Education:** You are currently enrolled in a Bachelor's degree (minimum 3rd year completed) or a Master's program in Agronomy, Plant Science, Ecology, or a related field, or in a French *Ingenieur Agronome* program.
- **Technical Skills:** Basic knowledge of GIS and data analysis is required. An advantage but not a must.
- **Attributes:** You demonstrate a high level of motivation for field and laboratory work.
- **Communication:** Proficiency in English is highly recommended for working within our multicultural team.

What We Offer

- **Professional Environment:** We provide an informal and multicultural research setting characterized by high professionalism and close collaboration.
- **Facilities:** The intern gains access to advanced laboratories, field-scale research facilities, as well as a network of researchers working on sustainable solutions for global challenges in soil, plant, and environmental sciences.
- **Work-Life Balance:** We offer a flexible workplace that emphasizes mutual trust, respect, and diversity.
- **Mentorship:** You will receive direct supervision and professional sparring from experienced researchers, e.g. Eusun Han (Associate Professor, Internship Director).

About Housing

The university provides assistance in finding student housing: dormitories on-site (Foulum), dormitories in Viborg (The Nørresø Dormitory, Camp Logos).

Interested?

Please send your **CV and a motivation letter** to Postdoc Yulin Zhang (Internship Supervisor) at **yulin.zhang@agro.au.dk** no later than **February 10, 2026**.