

## Cover crop characterisation with remote sensing (Msc thesis offer)

### The challenge

Cover crops are vital for sustainable farming as they improve soil health by preventing erosion, adding organic matter, and enhancing nutrient cycling. Additionally, cover crops promote biodiversity and contribute to carbon sequestration, making them a key tool in mitigating climate change and supporting agricultural resilience.



Remote sensing allows the characterisation of vegetation from a distance. In this thesis we will use very high resolution RGB and hyperspectral drone data to characterise the ground cover and biomass of different cover crop species/mixtures. The work will be an important step in establishing models that can be applied from satellites at the landscape scale.

### Your opportunity

We are looking for a highly motivated Masters student with good programming skills, an interest in agricultural applications and a willingness to work in the field and process samples. You will learn how to analyse very high resolution RGB (segmentation) and hyperspectral drone data to build models for predicting land cover and biomass. As a result, you will be expected to:

- Fly a drone (DJI Mavic 3E RTK) and interpret (segment) the resulting RGB images
- Collect and analyse in-situ biomass samples in the field
- Process and analyse hyperspectral data to create models that predict biomass and cover crop ground cover

Your work will be based on a field experiment with several cover crop mixtures/varieties at Agroscope Reckenholz, Affoltern ZH. The field will be managed by the Agroscope team. The Earth Observation of Agroecosystems team at Agroscope will support you in data interpretation and analysis and will provide the hyperspectral data. You will have the opportunity to be mentored by the remote sensing experts in our team. To work on this project, you will need to bring with you

- Demonstrated practical experience in the interpretation of remote sensing data (optical / (hyper-) spectral). Knowledge of radiative transfer models is an advantage
- Solution-oriented, self-motivated and organised work ethic
- A collaborative team player personality
- (Very) good programming skills in Python

For more information, please get in touch with Helge Aasen ([helge.aasen@agroscope.admin.ch](mailto:helge.aasen@agroscope.admin.ch)).

### Working environment

You would become part of the young and dynamic Earth Observation of Agroecosystems team ([www.eoa-team.net](http://www.eoa-team.net)) at Agroscope, the Swiss centre of excellence in Agriculture. The proposed **start date is March 2025 (this can be adapted)**.

### How to apply

If you are interested, please send a short statement of motivation and your project-related experience to Helge Aasen ([helge.aasen@agroscope.admin.ch](mailto:helge.aasen@agroscope.admin.ch)).