MSc Thesis Opportunity (WUR & University of Göttingen)

Evaluating Automation in Strip-Cropping Systems: Assumptions, Benefits & Real-World Practice

Automation in agriculture is gaining attention, and more studies now attempt to quantify the economic and operational benefits of autonomous technologies compared to conventional machinery. These studies are no longer limited to monocultures: systems like strip cropping, as investigated in the Dutch CropMix project, are becoming an exciting testbed for future farming strategies.

However, strip cropping systems are still a niche, meaning that there are still a lot of untested and unmeasured factors. Especially, since there is much heterogeneity between strip crop systems. This MSc thesis project offers two possible research tracks, depending on your interest and skills. In both cases, you will help evaluate automation in strip-cropping systems.

Option 1: Testing Assumptions in Real Farming Practice

Many model-based studies rely on assumptions about how farms operate in strip-cropping systems or rely on measures on experimental farms. But are these assumptions true?

In this option, you will:

- Conduct field observations throughout the season on strip-cropping farms.
- Compare real machinery movements, field efficiencies, and operational sequences with those used in the literature.
- Compare experiences of strip crop farmers using automation with what is described in academic literature and modelling frameworks.

Option 2: Extending Current Calculations to More Complex Strip Configurations

Most existing studies evaluate automation in strip-cropping setups (e.g. few crops or one strip width). However, Dutch practice shows a wide variety of designs with multiple crop combinations and diverse strip widths.

In this option, you will:

- Analyse current modelling frameworks for automation in strip cropping.
- Extend them to include more realistic strip layouts in Dutch arable context.
- Evaluate how crop combinations and strip widths influence automation benefits.

Supervision & Collaboration

You will be supervised jointly by:

- Jan Patrick Plöger, Agricultural Technology, Georg August University of Göttingen
- Lisa Marijke van den Berg, Agricultural Biosystem Engineering Group, Wageningen University & Research; Industrial Engineering & Innovation Sciences, Eindhoven University of Technology

This project directly aligns with the ongoing work of Jan Patrick, offering you a chance to integrate your thesis into a broader research effort. The project is part of the CLAAS Stiftung Twinning Program, supporting innovation and international collaboration in agricultural engineering. Work location can be arranged flexibly and depending on your project design, the work may take place both in the Netherlands or Germany.