# PROJECT FACTSHEET

www.list.lu/index.php?id=29&no_cache=1&L=2&tx_listprojects_listprojectdisplay%5BlistProjects%5D=712&cHash=76fcba3bb5c9b520c7933d800491eda1

# ADAPT

Agricultural management to reduce soil greenhouse gas emissions, enhance soil carbon and increase crop drought resilience.



## Inspiration

Agriculture is essential to ensure food security worldwide but faces climate extremes, dramatically reducing crop yields. Moreover, agriculture also exacerbates climate extremes through management-related emissions of greenhouse gases (GHG) and losses of soil organic carbon (SOC).

The EU Green Deal and national commitments to reduce emissions need agricultural management solutions that reduce GHG emissions, protect and sequester SOC, and increase crop climate-resilience, for example by maintaining yields during drought. Evaluating these solutions requires accurate local accounting and projections of current GHG emissions, in conventional and improved cropping systems.

## Innovation

The ambition of ADAPT is to provide a smart-cropping management solution that incorporates under-sown and cover crops, minimal tillage and reduced synthetic nitrogen additions. To achieve these goals, LIST researchers, together with the University of Aberdeen will assess the impact of smart cropping and conventional cropping on GHG emissions in a field experiment on two Luxembourg farms, with a controlled drought.

The efficacy of biological indicators of SOC sequestration, including microbial and earthworm abundance, microbial diversity and efficiency, and the transfer of microbial necromass pools to SOC will also be assessed. The GHG and SOC data will be used to calibrate and validate three biogeochemical process models. After model comparison, the best model will be combined with regional climate projections to model the future evolution of GHG emissions and SOC sequestration for Luxembourg croplands, and to generate a carbon balance under different future climate scenarios.

## Impact

ADAPT will transfer knowledge into Luxembourg: Project partners from the University of Aberdeen are global experts in modelling SOC and GHG emissions in agriculture and will train staff at the Luxembourg Institute for Science and Technology in this valuable skill. Throughout the project, the ADAPT team will disseminate field and modelling results to the farm community. Finally, improved GHG emissions maps for croplands will be delivered to policy makers, an important step-change towards reducing cropland GHG emissions.

**Partners**

University of Aberdeen (UK)

**Financial Support**

Fonds National de la Recherche , Ministère de l'Agriculture, de la Viticulture et du Développement Rural

**Contact**

5, avenue des Hauts-Fourneaux
L-4362 Esch-sur-Alzette
phone: +352 275 888 - 1 | LIST.lu

Kate BUCKERIDGE (kate.buckeridge@list.lu)

© Copyright March 2024 LIST

LUXEMBOURG INSTITUTE OF SCIENCE AND TECHNOLOGY | LIST