

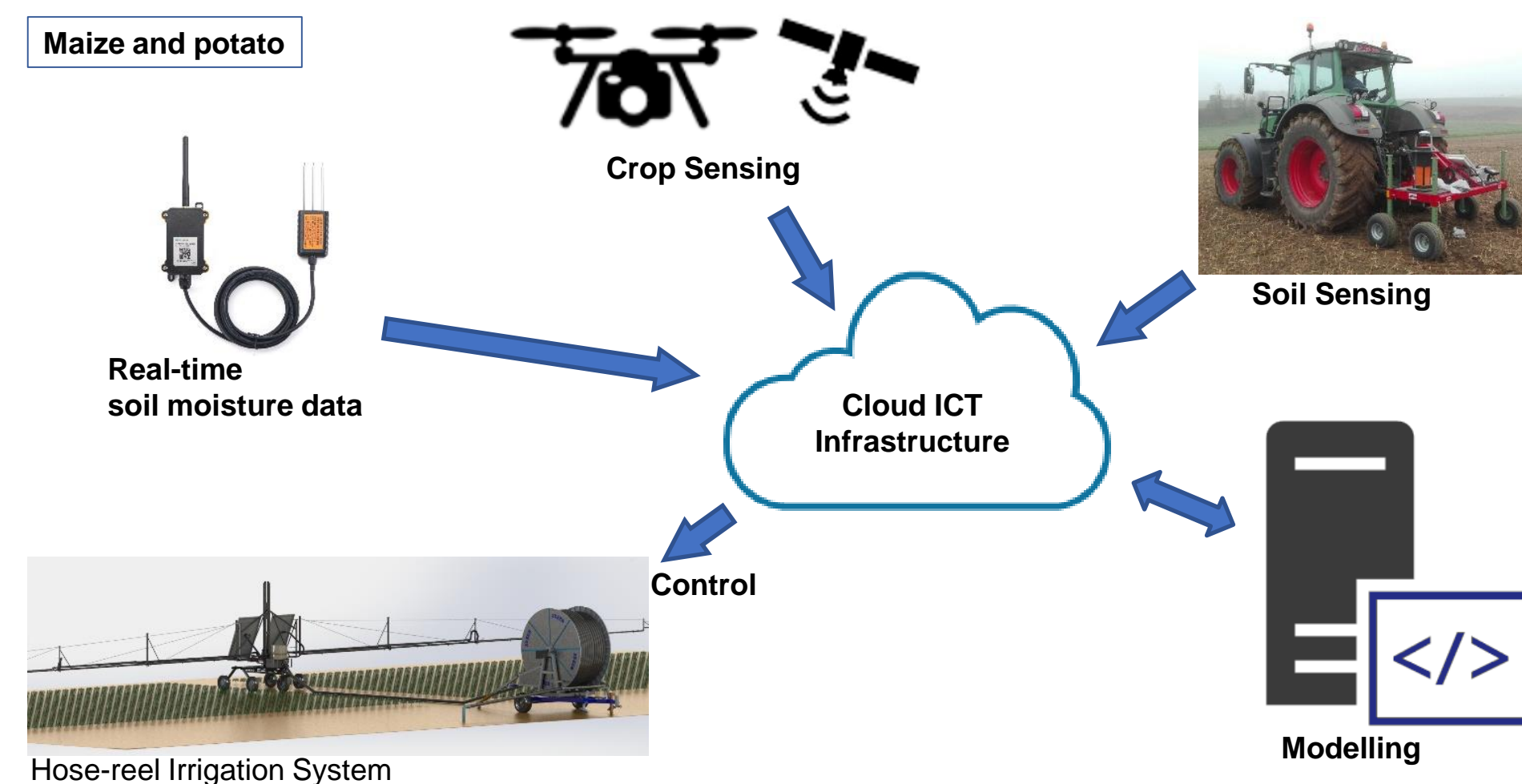
# A Data Driven Platform for Site-Specific Fertigation

## Summary

Aim of the project is to design and develop a fully-automated ICT-based data-driven platform for **variable rate fertigation (VRFI)**. The solution will attempt to account for all nutrients and water related limiting factors on crop yield by implementing advanced data fusion tools to derive VRFI recommendations.

## Research question

Can nutrients and water be combined during a VRFI process to maximize yield and reduce input cost, environmental footprint and water use in agriculture?

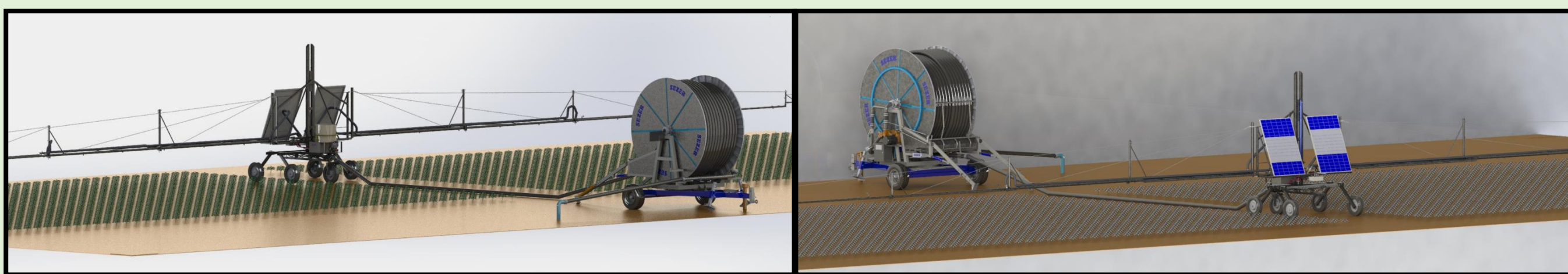


## Main objectives

- Developing a Hose-Reel-Irrigation System for VRFI.
- Acquiring spatial data on soil and crop with IoT-based sensor technologies.
- Developing algorithms for data fusion and decision-making for fully automated VRFI.
- Developing a cloud-based framework and user-friendly interface platform.
- Data visualization for faster actions and to communicate findings.

## Preliminary results

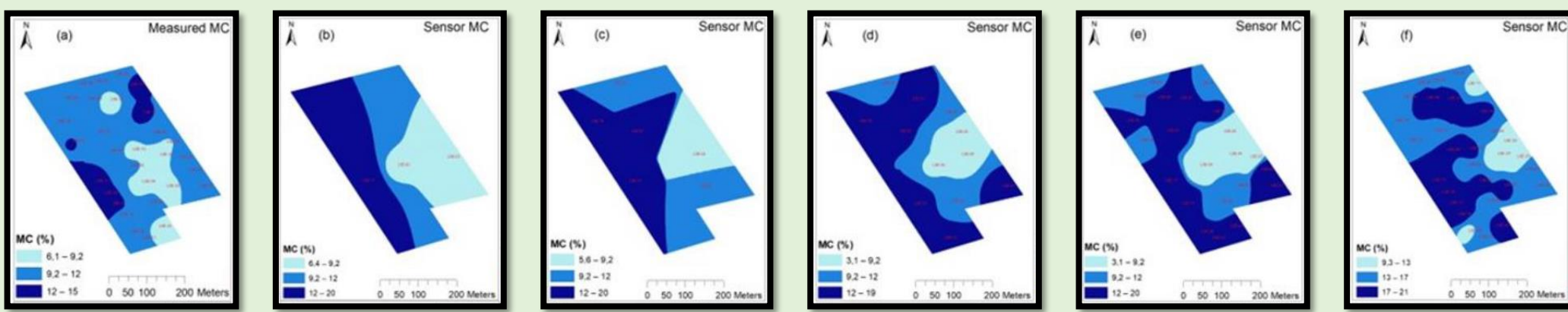
- Development of the Hose-Reel-Irrigation System in process:



- Installed soil moisture sensors and streaming live data into the cloud:



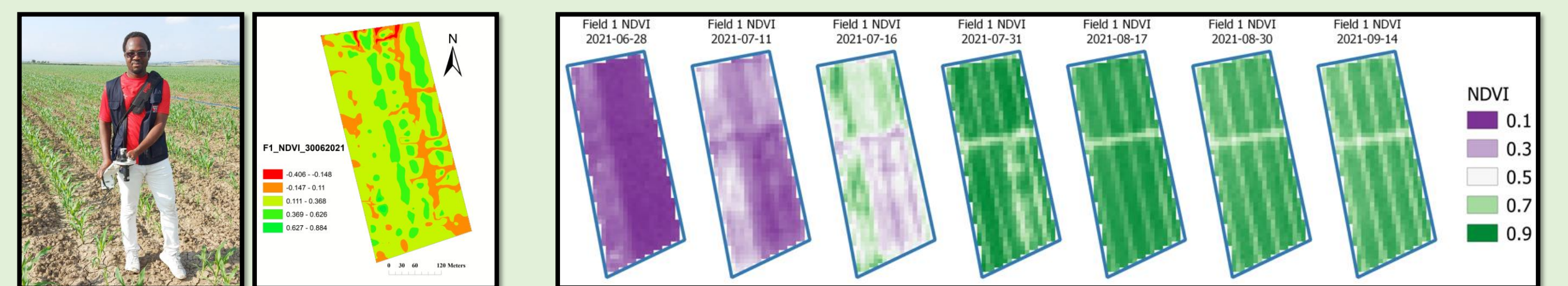
- Optimized the number of soil moisture sensors in the field:



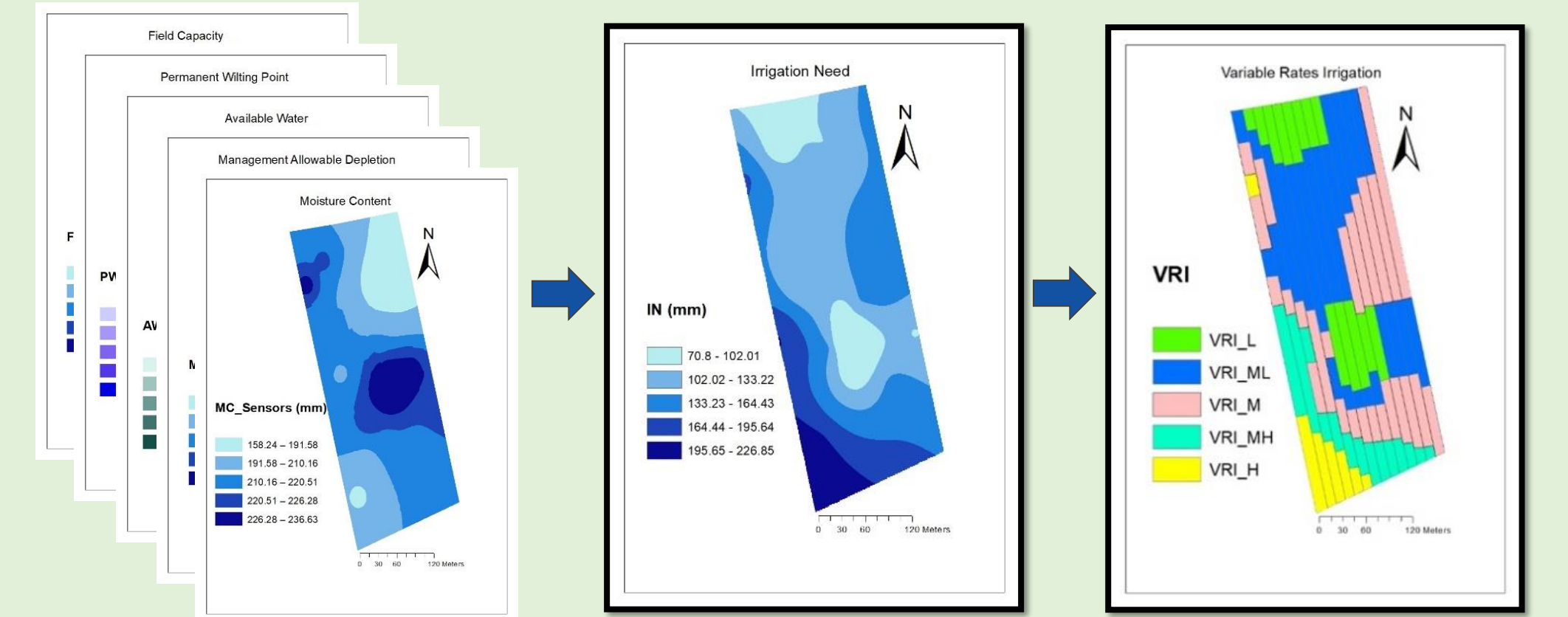
- Soil sensing and modelling done in Belgium, Germany and Turkey:



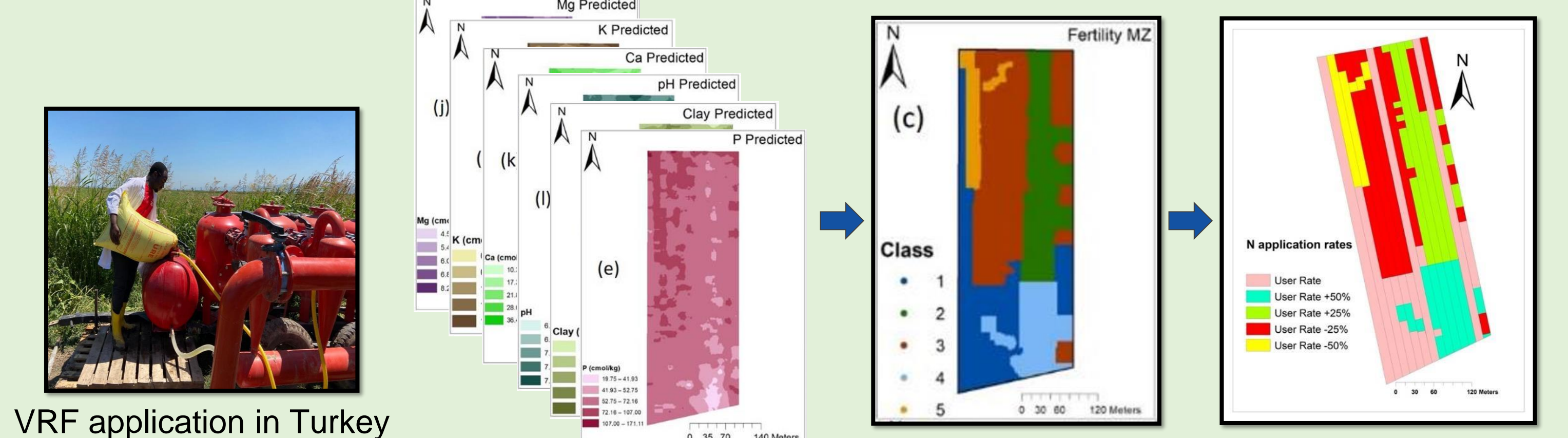
- Crop sensing done in Turkey using SpectroSense and Sentinel 2:



- Irrigation recommendation maps used 2022 in Turkey:



- Fertilization recommendation maps used 2022 in Turkey:



## Preliminary conclusions and potential impact

### Economic impacts:

- Increased profitability by increased yield while using less N, P, K fertilizer and water

### Environmental impacts:

- Reducing fertilizer runoff into water resources.
- Reduction of greenhouse gas emissions by using less fertilizers.

### Societal impacts:

- Conserving the available water resources by introducing a more sustainable irrigation technique.

### Scientific impacts:

- The integrated hardware and software infrastructure can be used for future research projects in the context of precision agriculture, soil and water management, and environmental soil threats.

## Future research activities

- Validate the fully-automated ICT platform for VRFI in commercial fields in Belgium, Germany and Turkey.
- Life cycle analysis (LCA) to evaluate the environmental and economic performance of the developed solution.
- Communicate with key stakeholder groups to promote adoption of the combined solution.



Visit of Hilde Crevits, the Flemish minister of Agriculture at the test site in Belgium.

