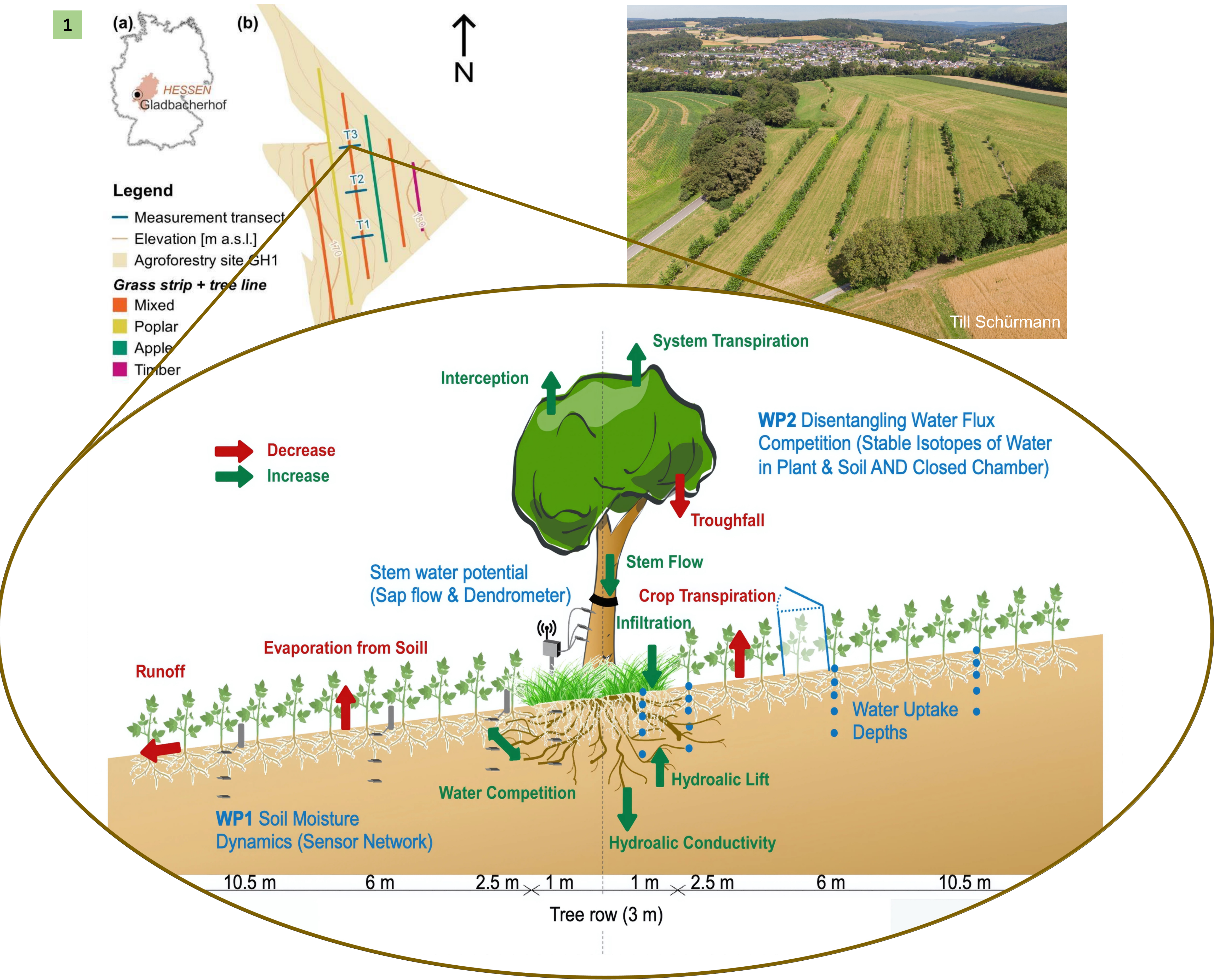


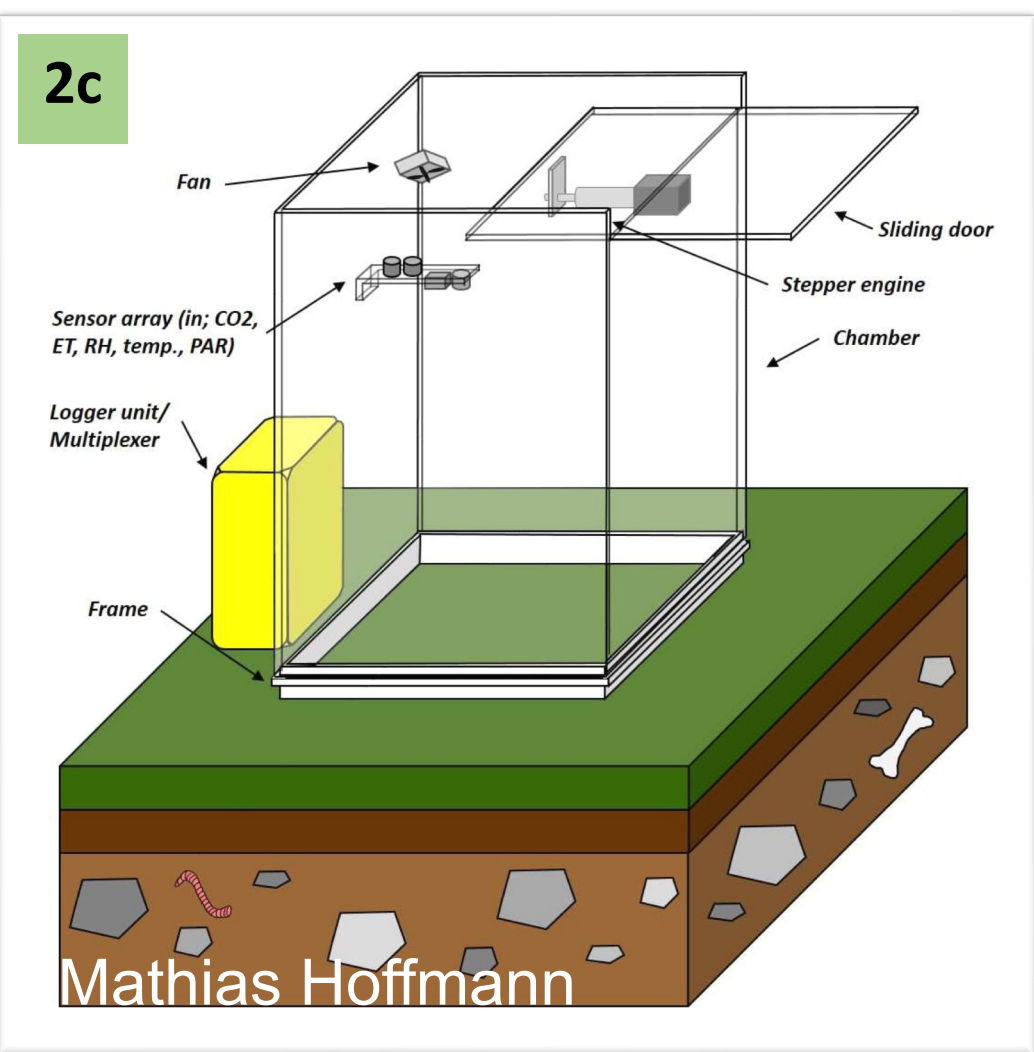
Objectives

The objective of this project is to quantify how the inclusion of trees in arable fields affects the spatial dynamics of soil moisture, water fluxes, and water flux partitioning (evaporation vs. transpiration) (Fig. 1).

Multi-method approach to capture relevant water fluxes from plant to field scale:



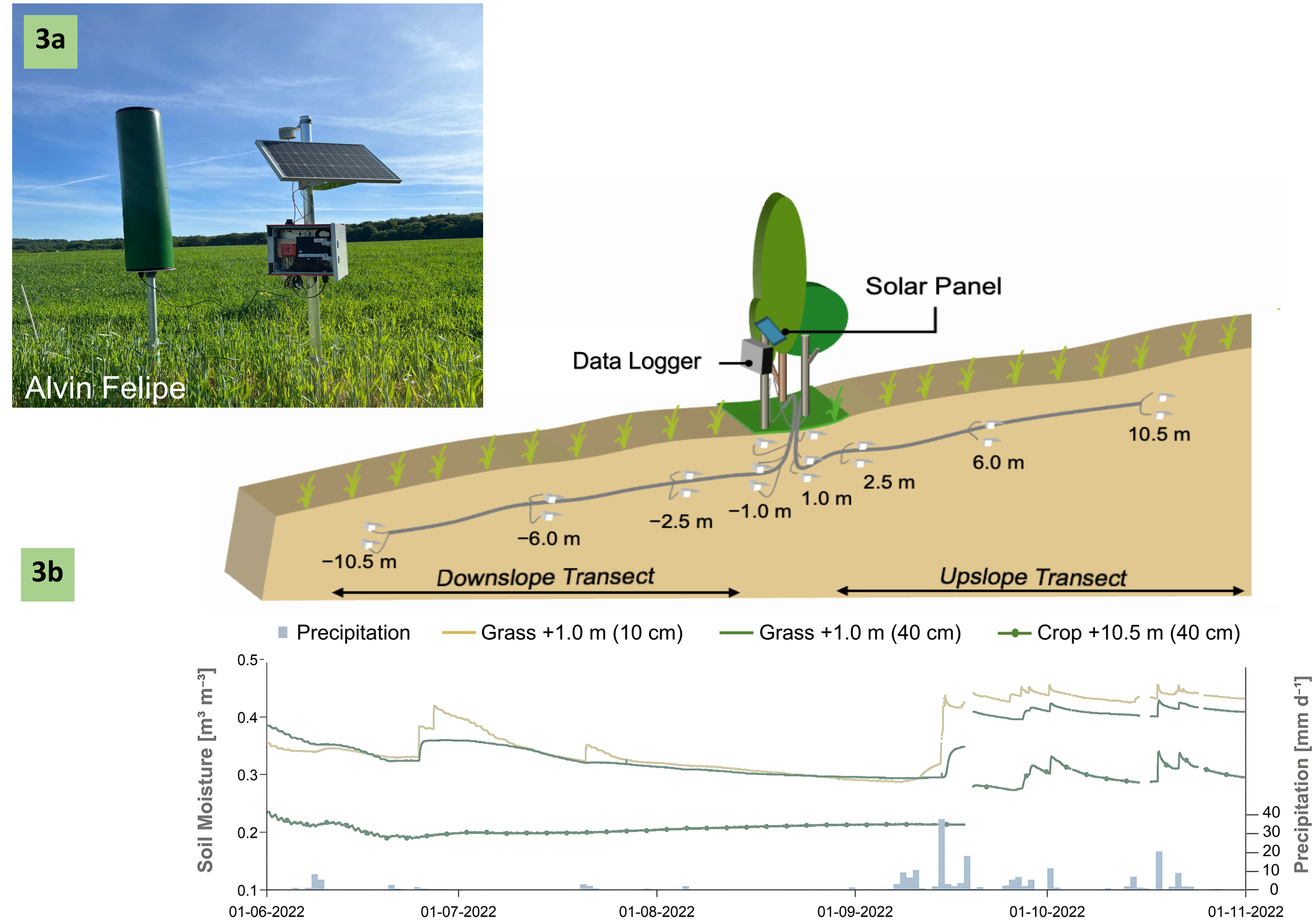
Methodology



- 2a) Dendrometer mounted on the poplar for tree growth measurements
- 2b) Sap flow sensors for individual tree water flux estimation
- 2c) Automatic gas chamber for measuring crop transpiration and evaporation fluxes

Methodology

- 3a) Cosmic Ray Neutron soil moisture sensor for field-scale analysis
- 3b) Soil moisture sensor network along transects perpendicular to the tree row; Measured precipitation and associated changes in soil moisture content at different distances from the tree and soil depths; Quantification of hydraulic lift through daytime vs nighttime soil moisture measurements



- 4a) Cryogenic vacuum extraction system for sampling stable water isotopes for flux partitioning (Orlowski et al., 2013)
- 4b) Sampling design along transects upslope and downslope of the grass strip with trees to estimate the contribution of different soil water uptake depths using water isotopes

