

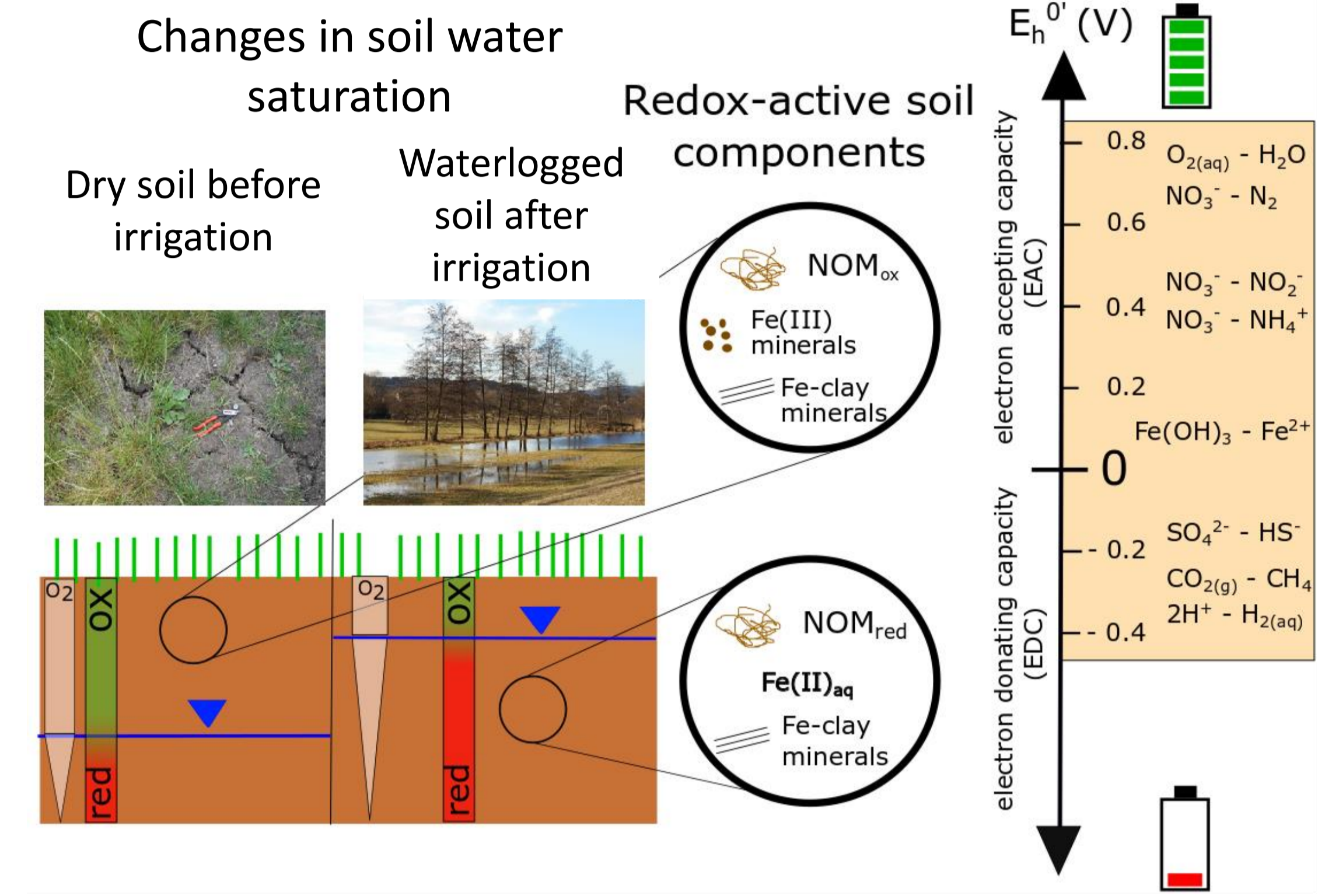
An interdisciplinary field experiment: Simulation of a heavy rain fall event to unravel redox dynamics, microbial response and glyphosate mobility in floodplain soils

Johanna Schlögl^a, Benedikt Wimmer^b, Lena Cramaro^c, Johannes Wirsching^d, Christian Poll^d, Ellen Kandeler^d, Christian Griebler^c, Carolin Huhn^b, Stefan B. Haderlein^a, ^aEberhard Karls Universität Tübingen, Centre for Applied Geosciences, ^bEberhard Karls Universität Tübingen, Institute of Physical and Theoretical Chemistry, ^cUniversität Wien, Department of Functional & Evolutionary Ecology, ^dUniversität Hohenheim, Department of Soil Biology

Objectives

The irrigation experiment tackled two major questions of the CAMPOS P4 project (in cooperation with P6):

Dynamics of redox processes and microbial communities



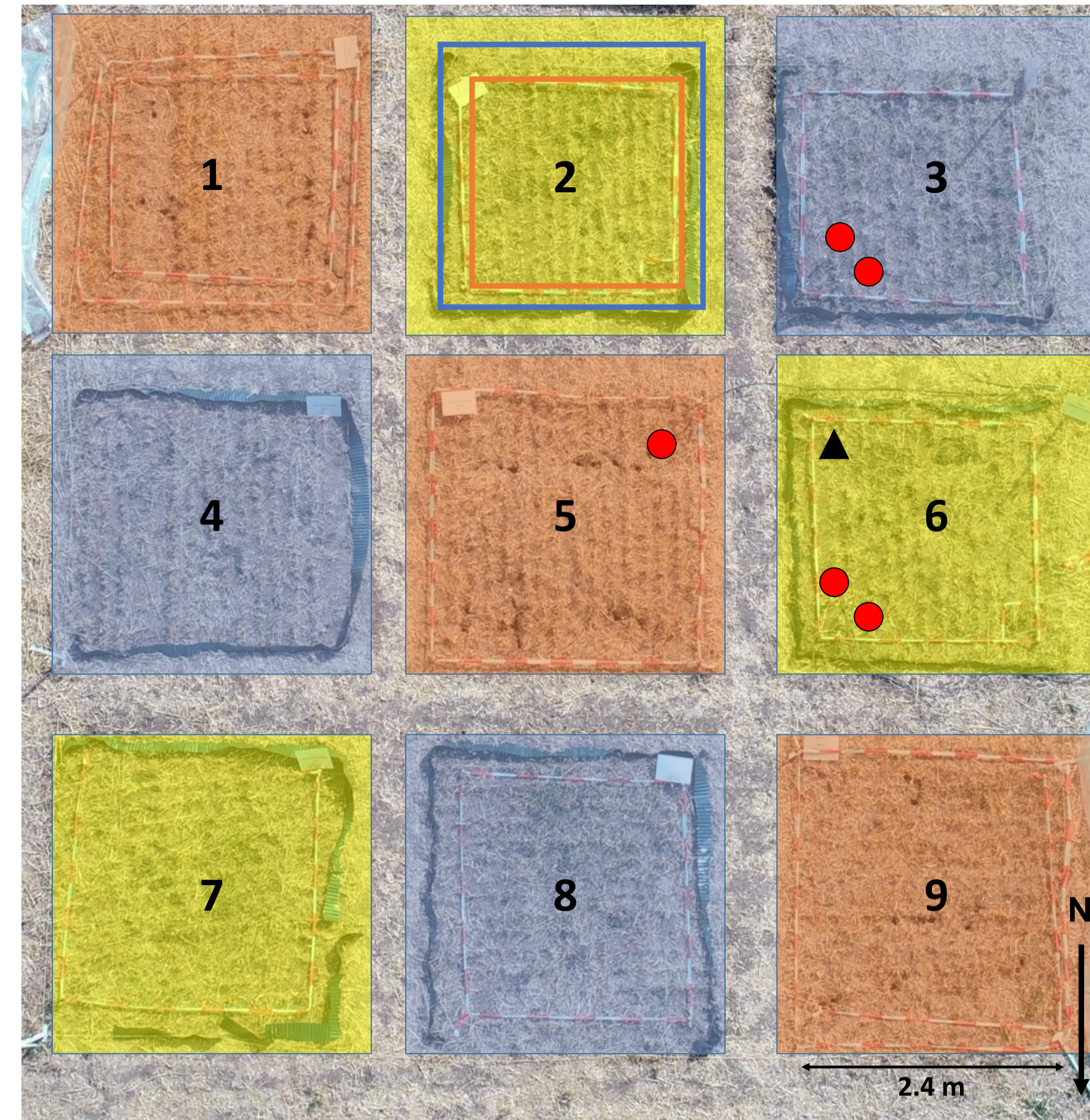
- How quickly do redox conditions change from oxic to anoxic during and after a heavy rain fall event?
- How do redox-active substances react to these changes?
- How and how quickly do microbial communities adapt to a change in redox conditions?

Glyphosate mobility and degradation



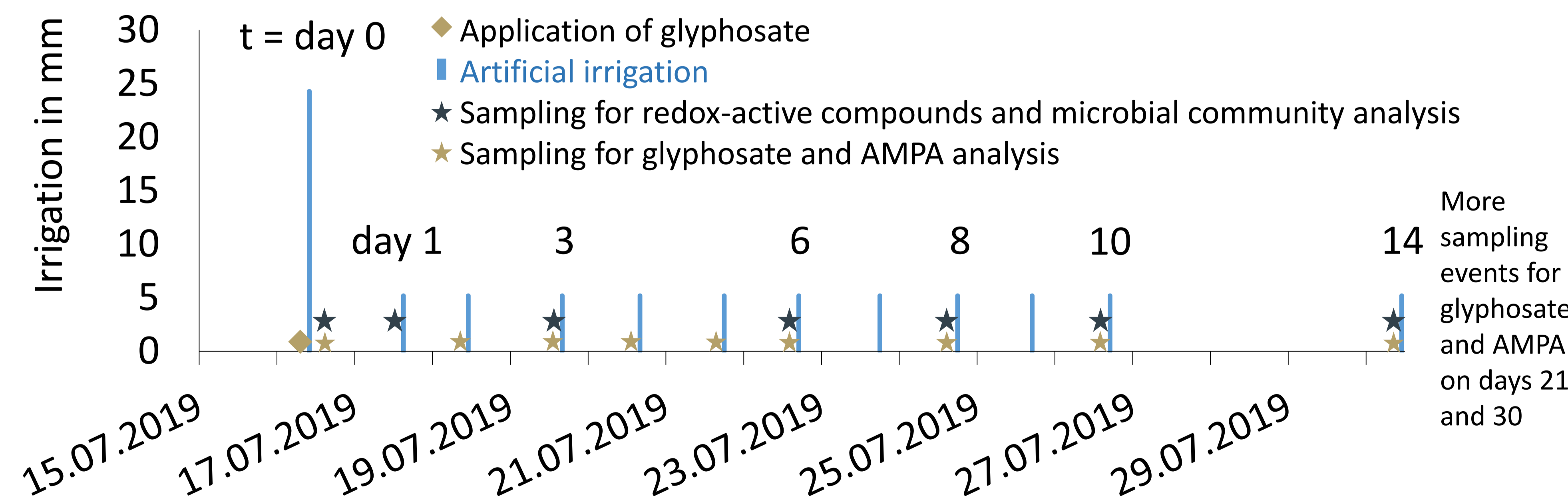
- How does GLP dissipation progress in top soil layer of 15 cm depth over time?
- Is glyphosate mobility influenced by preferential flow along shrinkage cracks?
- Do different redox conditions influence glyphosate degradation?

Experimental Setup



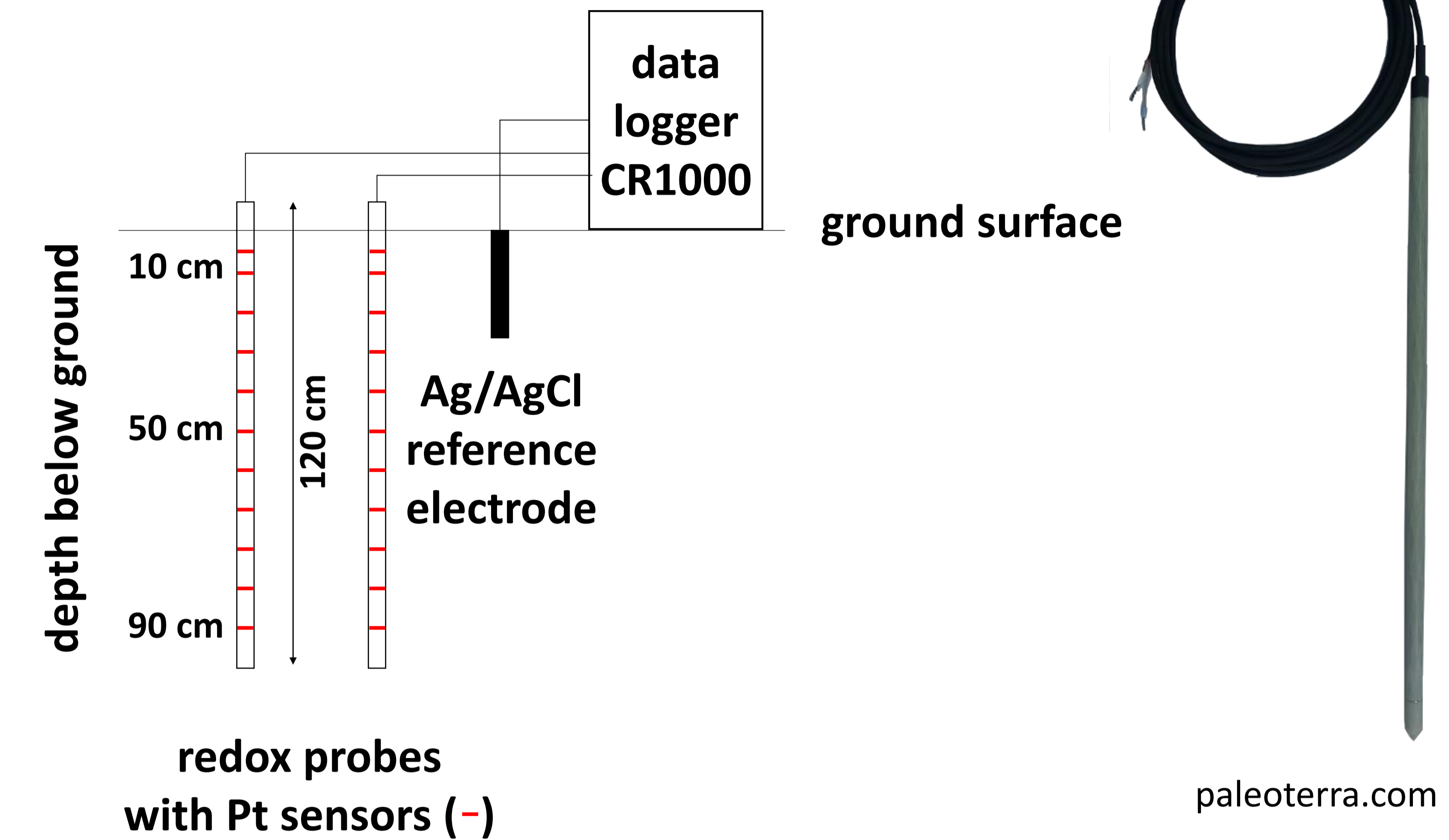
- Plot dimensions**
 Outer dimensions: 2.4 m*2.4 m
 Inner sampling area 2 m*2 m
- Plot treatments**
- Fields 2, 6, 7: ¹³C₃- and ¹⁵N-labelled glyphosate and water
 - Fields 3, 4, 8: Water only
 - Fields 1, 5, 9: Dry control
- Installations**
- Redox probe
 - Reference electrode

Irrigation and sampling scheme



- Throughout the experiment, deionized water was used for the irrigation.
- The water used for the simulation of the heavy rain event at day 0 was spiked with D₂¹⁸O to follow the water pathways in the soil later.

Redox probes



Results presented on separate posters

See CAMPOS P4 homepage: <https://uni-tuebingen.de/forschung/forschungsschwerpunkte/sonderforschungsbereich/sfb-1253/projects/p4-floodplain-biogeochemistry/>

Schlögl et al. Capturing redox potential and nutrient dynamics in floodplain soils

Cramaro et al. Spatiotemporal dynamics of floodplain-soil microbial communities

Wimmer et al. Development and application of analytical methodology for glyphosate quantification

Acknowledgements

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