

# Spatial-temporal dynamics of microbial communities in floodplain sediments: Irrigation experiment 2019

Lena Cramaro\*, Johanna Schlögl\*\*, Stefan Haderlein\*\*, Christian Griebler\*

\*University of Vienna; Department of Functional and Evolutionary Ecology, Althanstraße 14, 1090 Wien

\*\* University of Tübingen, Center for Applied Geoscience, Hölderlinstraße 12, 72074 Tübingen

## Introduction

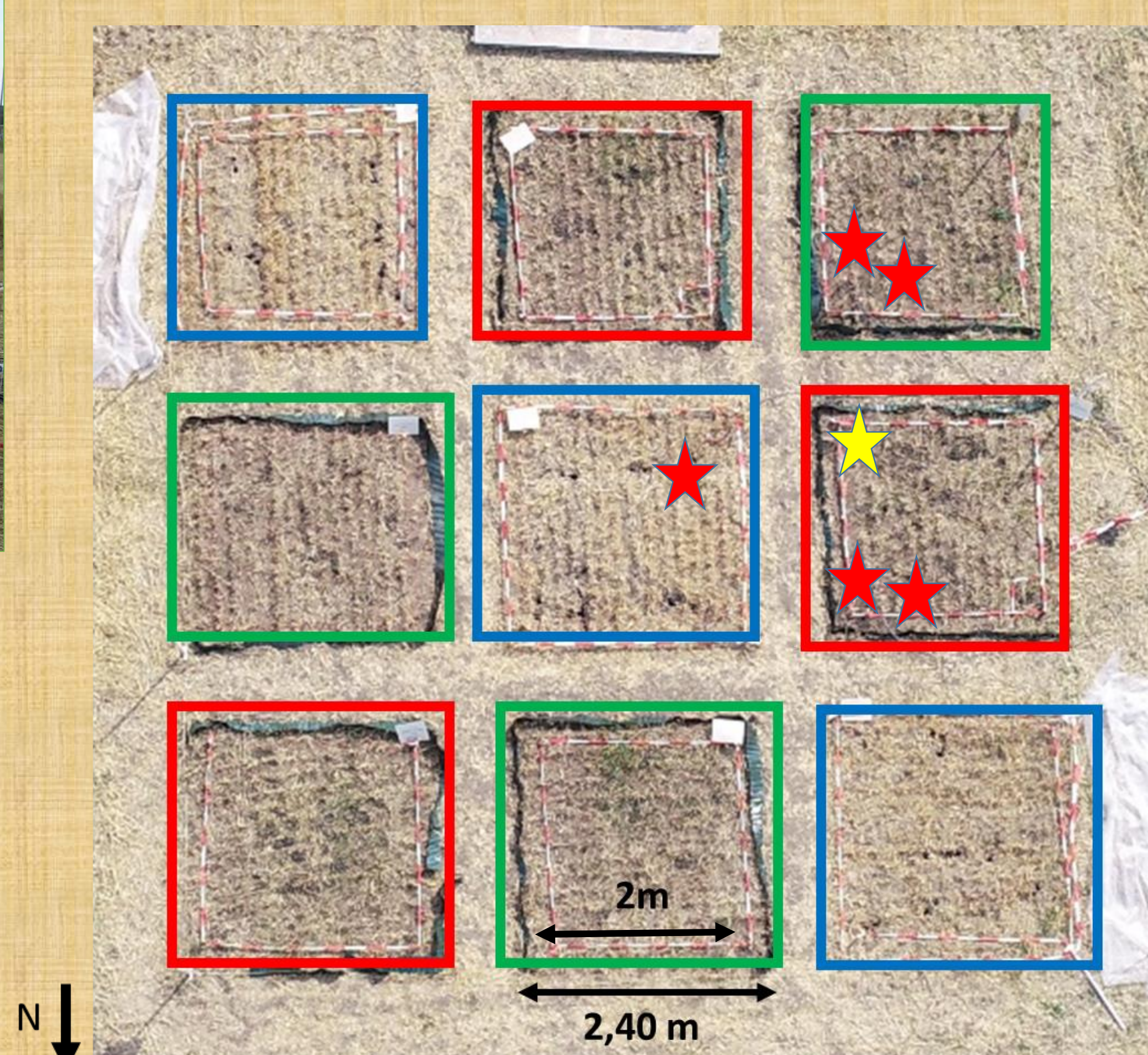
Floodplain soils are considered hotspots of biogeochemical activities driven by strong seasonal dynamics of precipitation, soil water saturation and redox conditions. During a two weeks enduring "irrigation experiment" in July - August 2019, integrated within SFB 1253 "CAMPOS: Catchments as reactors", we performed a heavy rain event to study the interlinkage of dynamic abiotic conditions and biotic processes governing carbon, nutrients and herbicide (glyphosate) turnover.



Artificial irrigation of the plots

**Objective** of our subproject is to search for a link between glyphosate biodegradation, redox conditions and changes in microbial community composition as well as in individual functional genes (e.g. denitrification).

## Experimental set-up

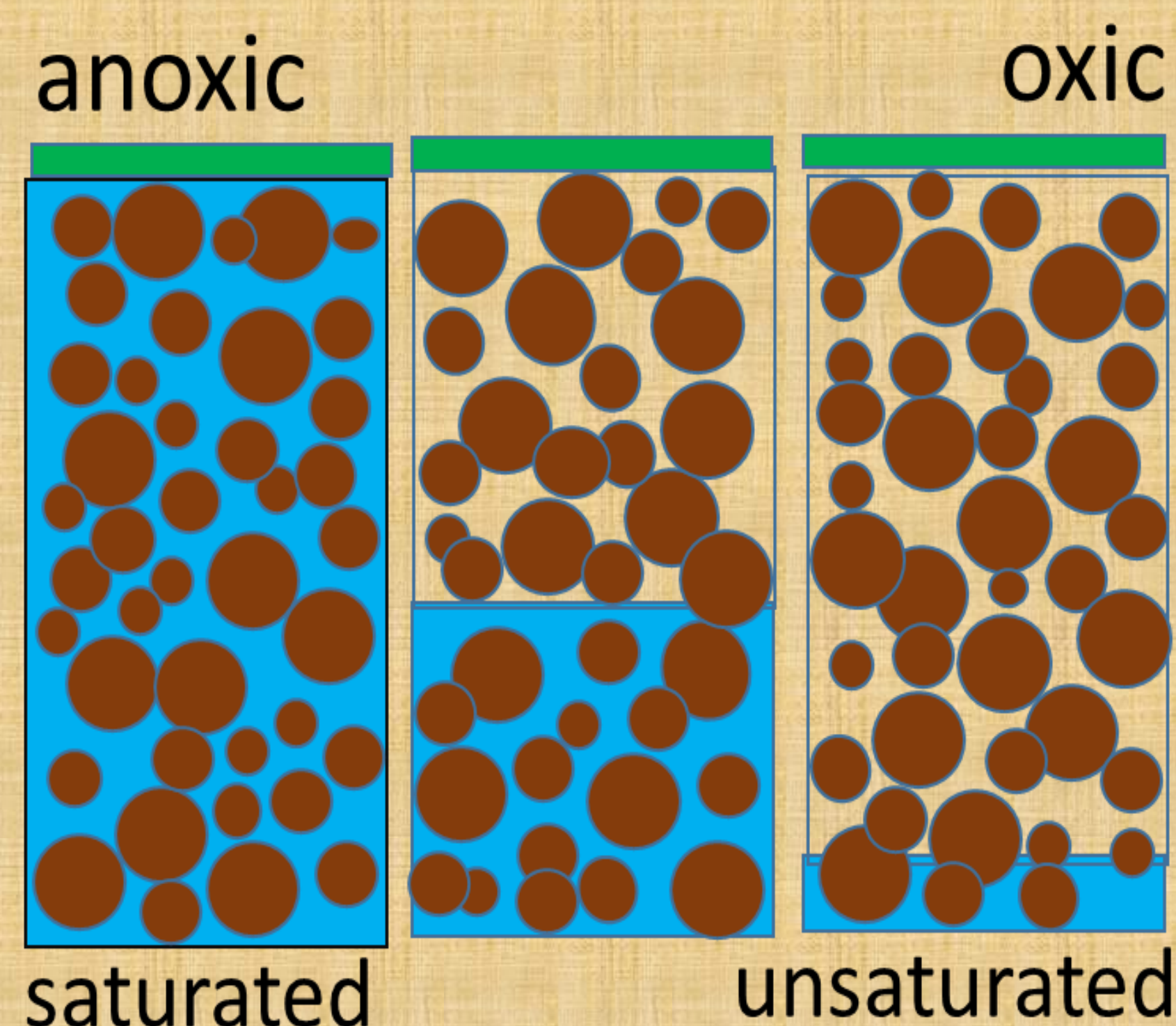


- No water/reference
- Water + Glyphosate
- ★ Redox electrodes
- ★ Reference electrode
- Water



50 cm soil core taken from every plot

We **hypothesize** that sudden hydrological events lead to sudden changes in dynamics in microbial processes. They cause redox dynamics that translate into shifts in microbial key processes, while the soil community composition remains stable.

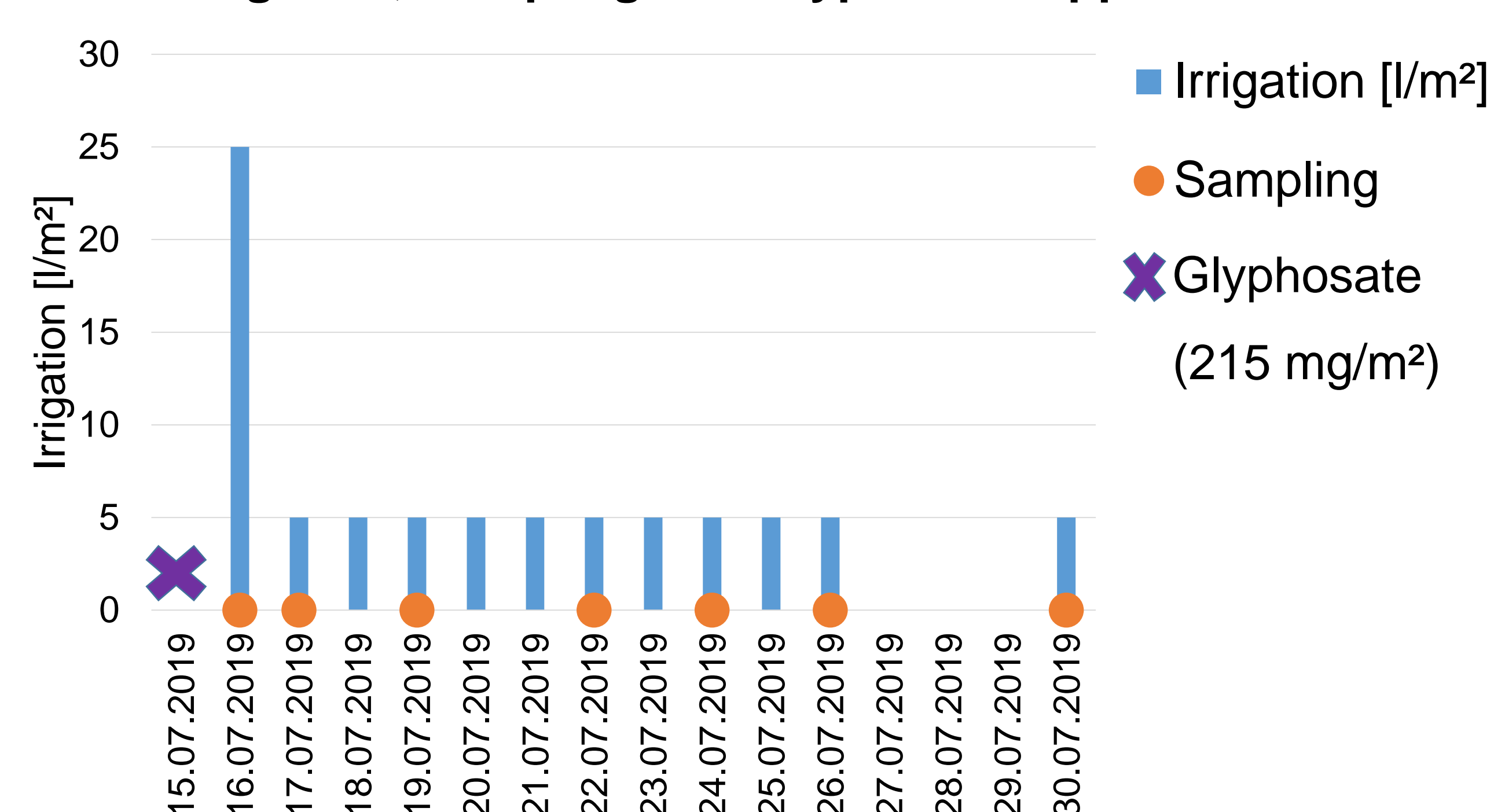


Soil under water saturated and unsaturated conditions

We **compare**:

- Dry vs. waterlogged
- Oxidic vs. anoxic
- Composition vs. activity of microbial communities

## Irrigation, Sampling and Glyphosate application



**The first results** available include data of soil moisture, pore water chemistry and isotopic composition as well as C:N-content and microbial activity measurements for three selected days in the beginning, mid and end of the experiment. Work in progress include metagenomic and transcriptomic analysis of microbial communities.

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