

# Cover crop-steered microbiomes to promote healthy crop growth

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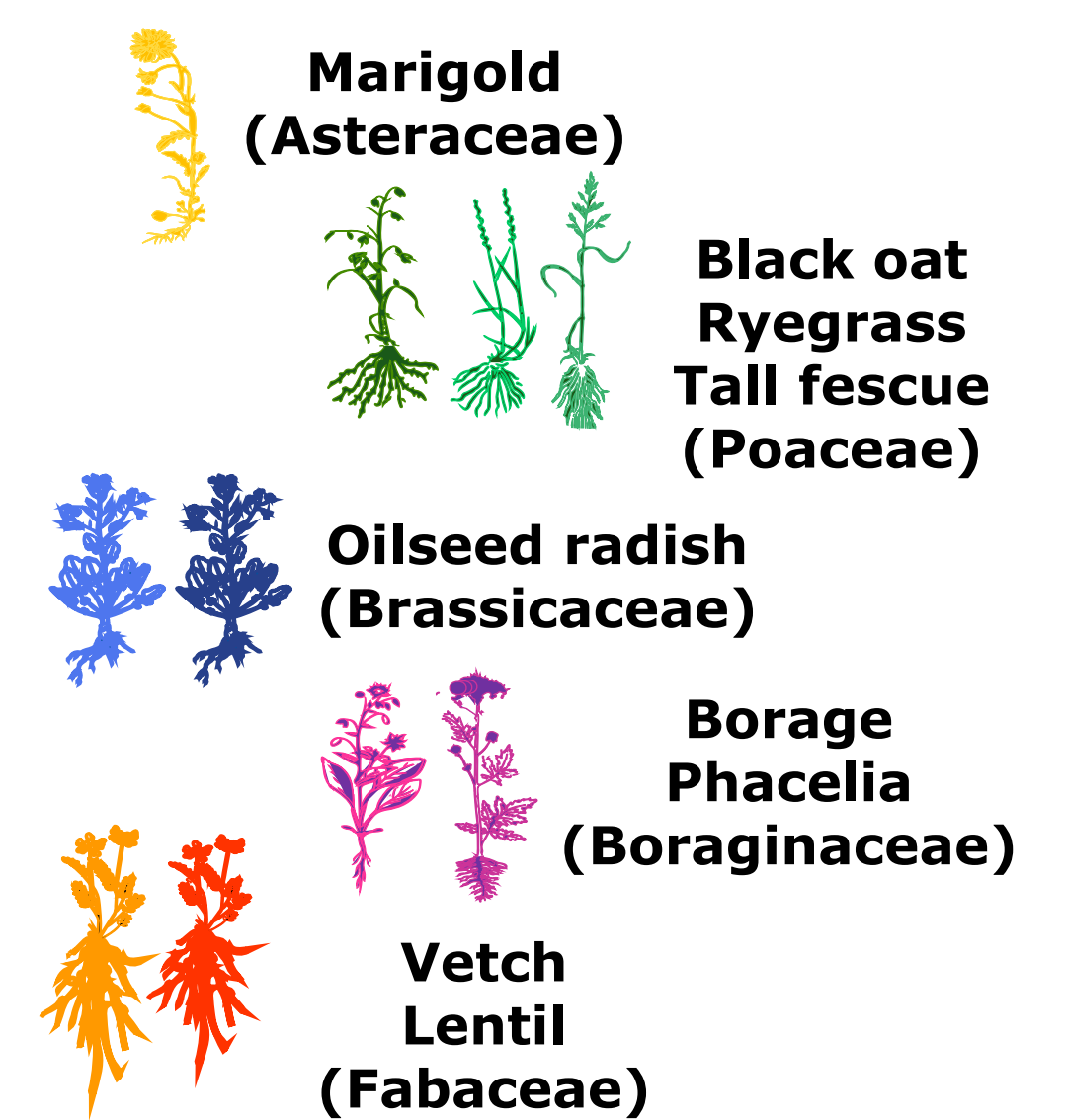
## Background and Aim

Cover crops—also referred to as green manures—are used to prevent nutrient leaching and supplement the organic matter content in agricultural soils. Cover crops can also be grown to stimulate and steer the soil microbial community to optimize healthy crop growth. However, despite their relatively widespread use, little is known about the impact of cover crops on the composition and activity of the microbiome and the persistence of such effects over time. This study aims at unravelling the **effect of ten cover crop species belonging to five plant families on the soil microbial community** of sandy soils over a cropping season.

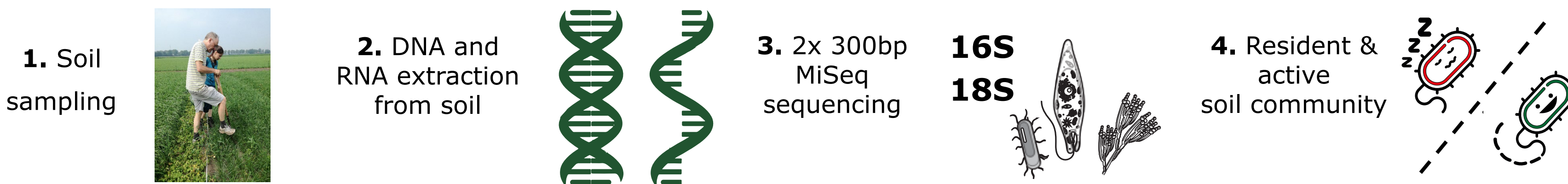
## Field experiment



## Cover crops

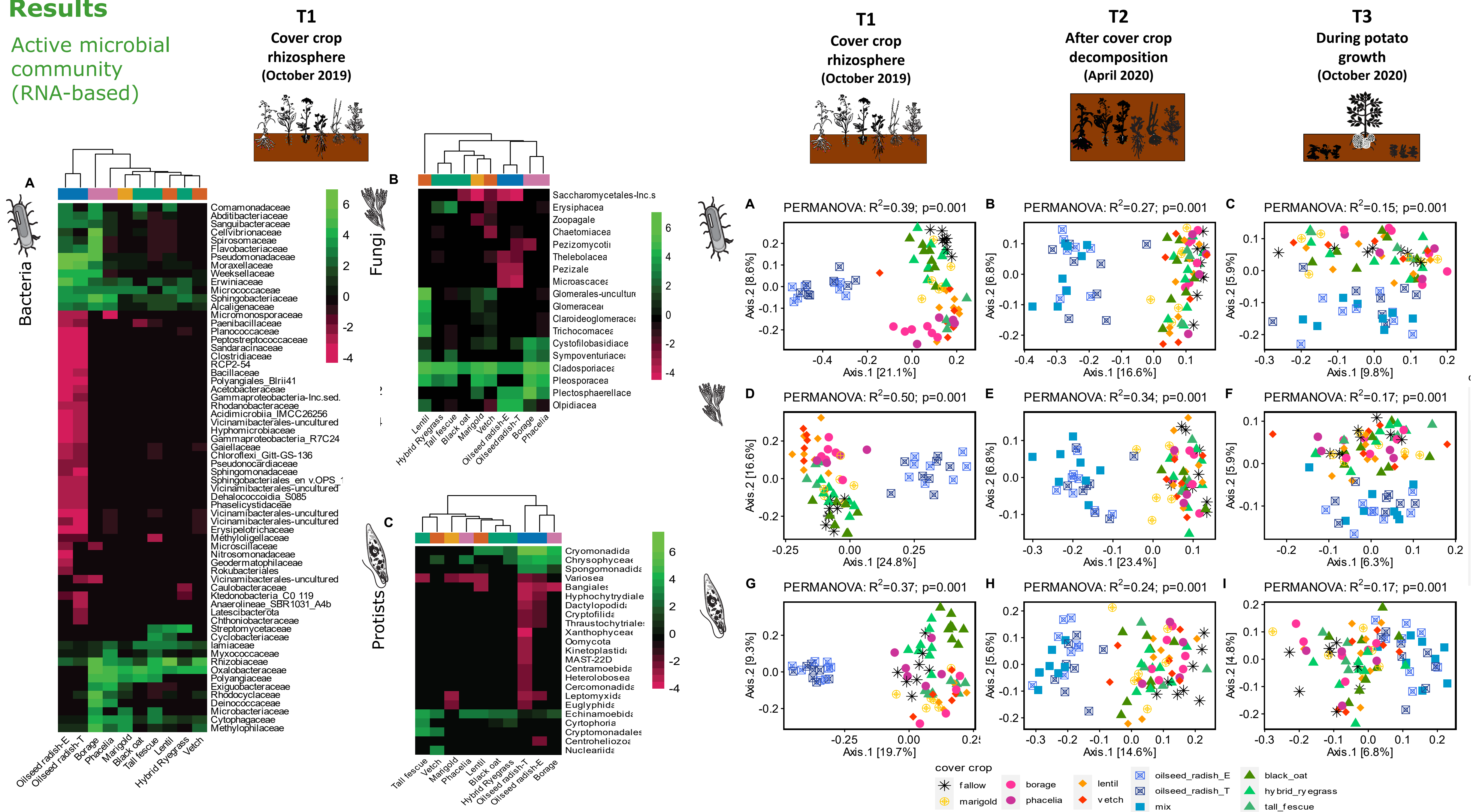


## Workflow



## Results

Active microbial community (RNA-based)



Heatmap of the beta coefficients assigned to the differentially abundant taxa pinpointed for the active community with ANCOM-BC. Green (beta coeff. >0) and red (beta coeff. <0) indicate taxa enriched and decreased in the rhizosphere compared to fallow soil. Cazzaniga et al. 2022, under review; preprint in bioRxiv (<https://doi.org/10.1101/2022.06.10.495641>).

Principal Coordinate Analysis (PCoA) of CSS normalised ASV data. Dissimilarity matrix built on Bray-Curtis metric and plotted separating ASV based on cover crop treatment. R<sup>2</sup> and p-values calculated with PERMANOVA for cover crop factor. Cazzaniga et al. 2022, in preparation.

## Conclusions

Cover crop identity matters:

- the ten investigated cover crop species have different effects on the soil microbiome composition and activity;
- all cover crops have a legacy effect lasting beyond their growth, but the magnitude of such effect depends on the cover crop species;
- representatives of the Brassicaceae plant family steer the microbiome in the most pronounced and persistent way



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