# Quantifying variability in plant-soil interactions across Saskatchewan grasslands

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## RESEARCH QUESTION

**How do grazing intensity and rest affect soil microbiota, plants and their interactions?**

## INTRODUCTION

- The grazing intensity can alter the plant's height and growth by reducing their photosynthesis and forcing them to use their storages to regrow.

- With these changes, soil microbiota can also be affected, thus impacting soil ecosystem functions, like carbon storage and plant productivity.

- Minimizing grazing impacts on ecosystem functions is important to achieve a more sustainable livestock activity.
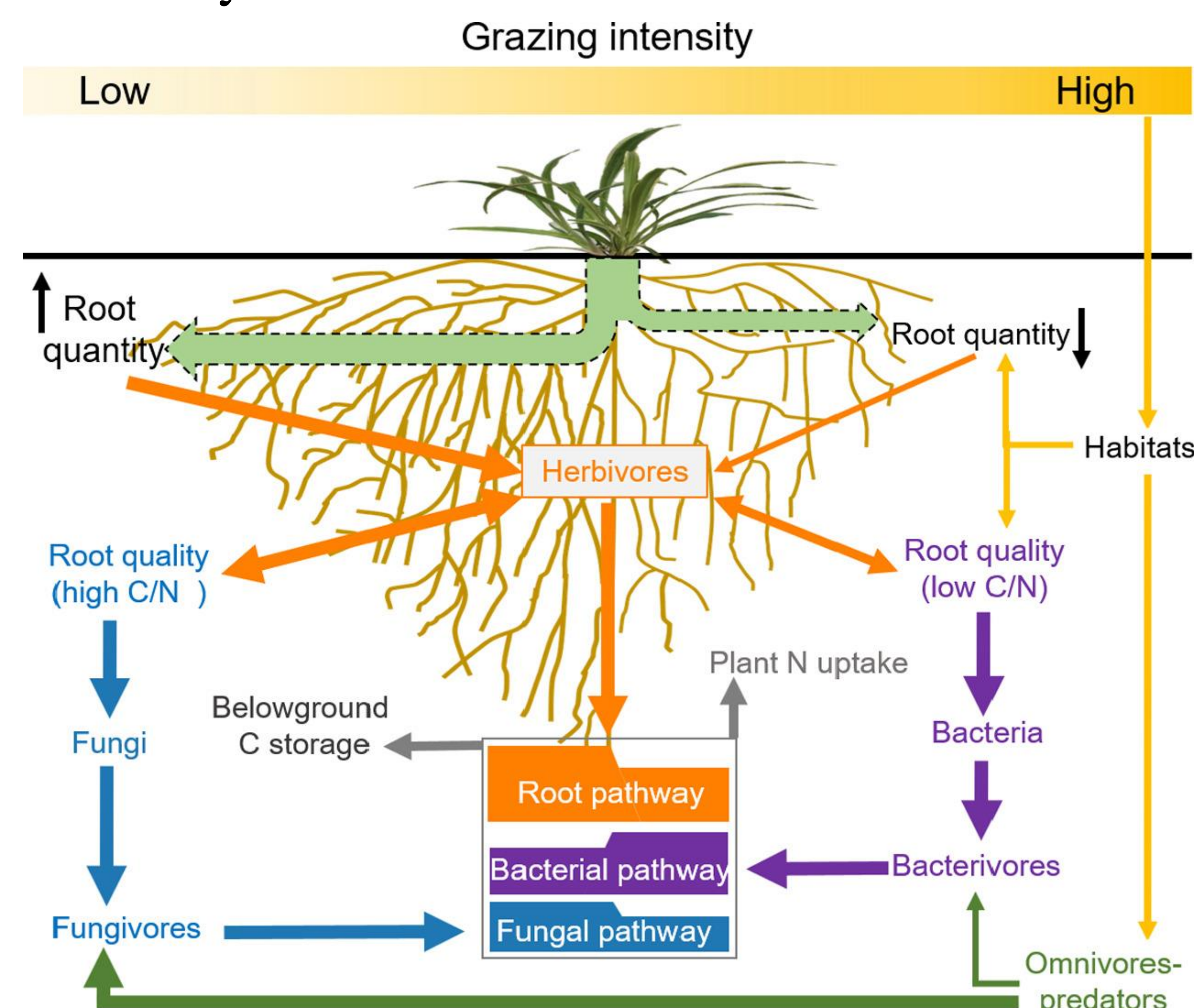
## OBJECTIVES

- Determine how grazing intensity and rest affect soil microbial communities and their interactions with plants.

- Understand the interrelationships among plant communities, soil microbial communities, soil carbon, and future plant growth.

## METHODS

- Soil samples were collected from places with different soil types, grazing intensity and rest durations

- The samples were sieved, four tubes were stored for DNA analysis and we collected a subsample for use in a greenhouse experiment.

- In the greenhouse experiment, we inoculated native and tame forage plants with soil to assess impacts of the microbes on plant growth.


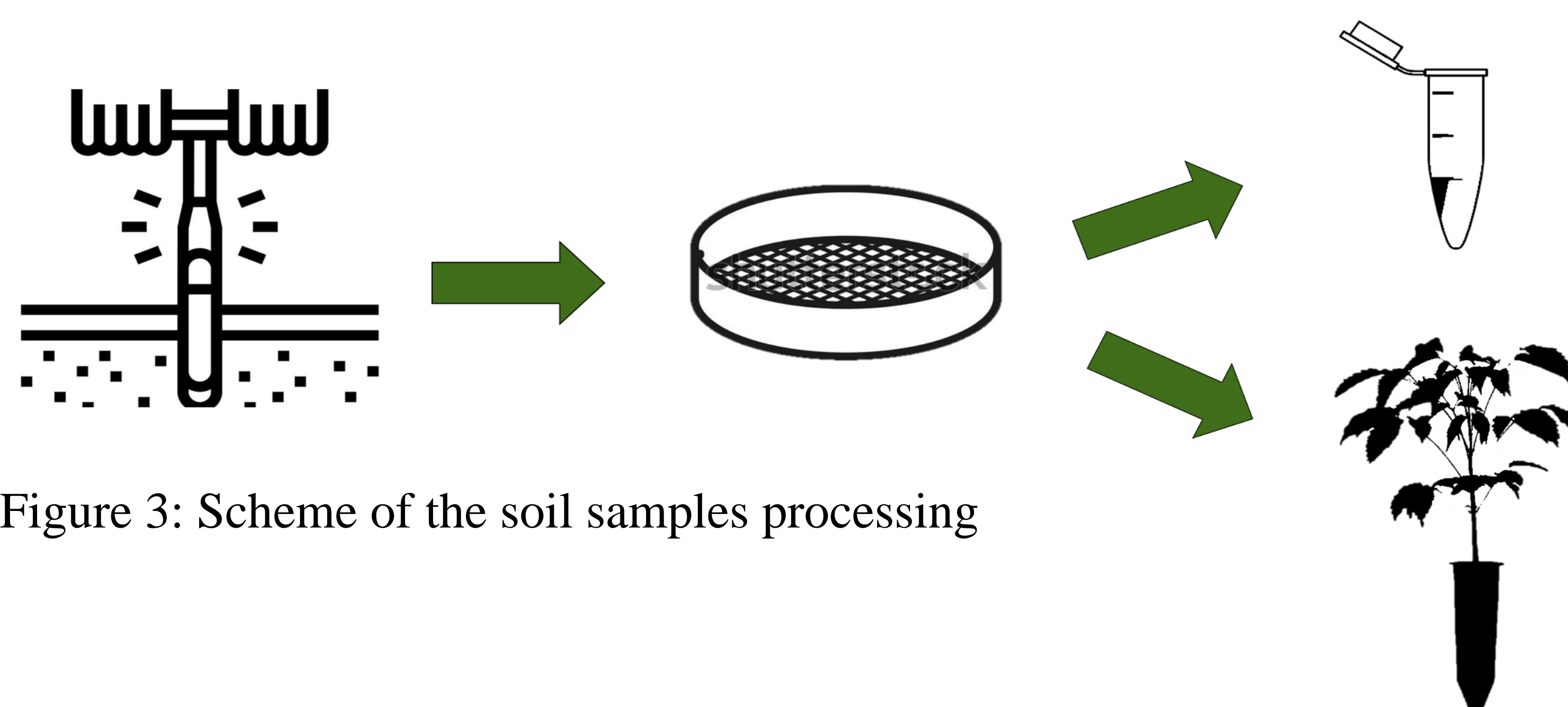Figure 2: Plants growing at greenhouse.

## NEXT STEPS

- We are going to assess the diversity and composition of the soil microbiota through DNA sequencing.


Figure 4: DNA samples storaged for future sequencing

- Shoot and root biomass of each plant will be measured to quantify plant growth.

- Structural equation models will be used to test direct and indirect relationship among the variables.

## REFERENCES

1. Wan et al. 2021. Appl. Soil Ecol. 168 (104161).

## ACKNOWLEDGEMENTS

Figure 1: Impacts of grazing intensity[1].


Figure 3: Scheme of the soil samples processing

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FUNDAÇÃO ARAUCÁRIA
Apoio ao Desenvolvimento Científico e Tecnológico do Paraná