Impact of integrated crop livestock farming systems (ICLS) on the soil microbial activity

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BACKGROUND

- **ICLS** integrates livestock into crop rotations through grazing of temporary grasslands and/or intercrops, reconnecting livestock and crop farming.
- Grazing animals improve **soil fertility** by the return of manure.
- **Heterogeneity** of droppings and urine influence soil biology and its fertility.
- Very few studies exist about the impact of ICLS on **soil microbiota** in temperate climates.

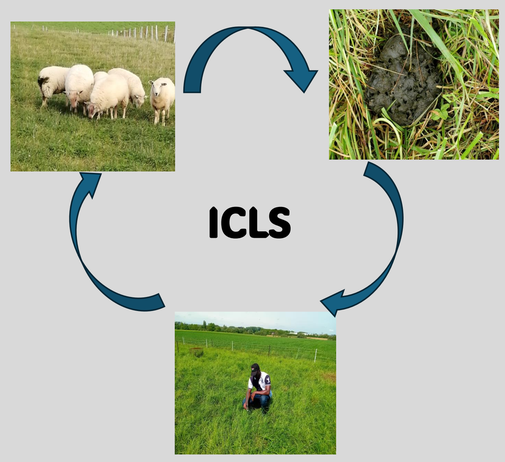


Figure 1: Integrated crop-livestock systems

QUESTION

ADOPTING AN ICLS ROTATION, HOW DOES THE INTEGRATION OF ANIMALS IN CROP ROTATION IMPACT **MICROBIAL LIFE** AND **CHEMICAL COMPOSITION** OF THE SOIL, AND **SHEEP BEHAVIOR?**

MATERIALS AND METHODS

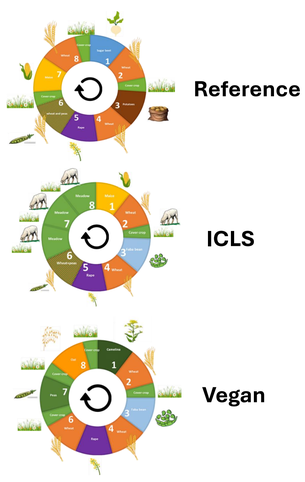


Figure 2: Rotations tested in Ecofoodsystem

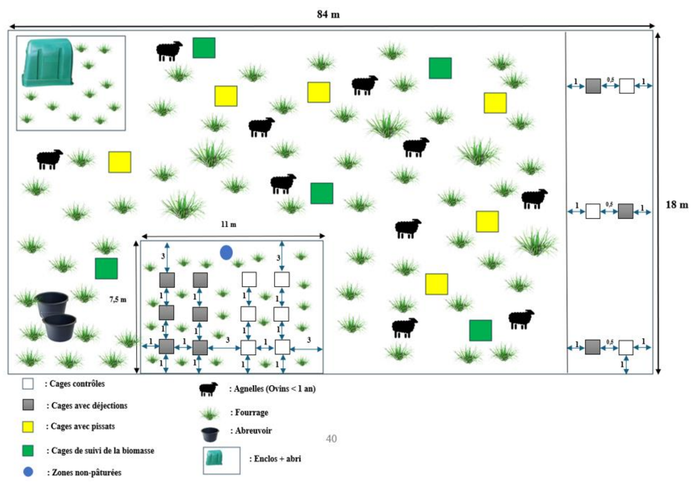


Figure 3: Experimental setup

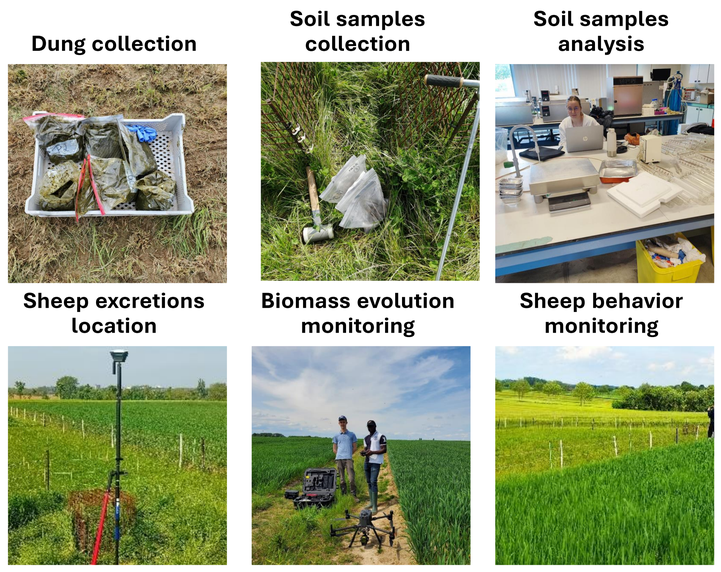
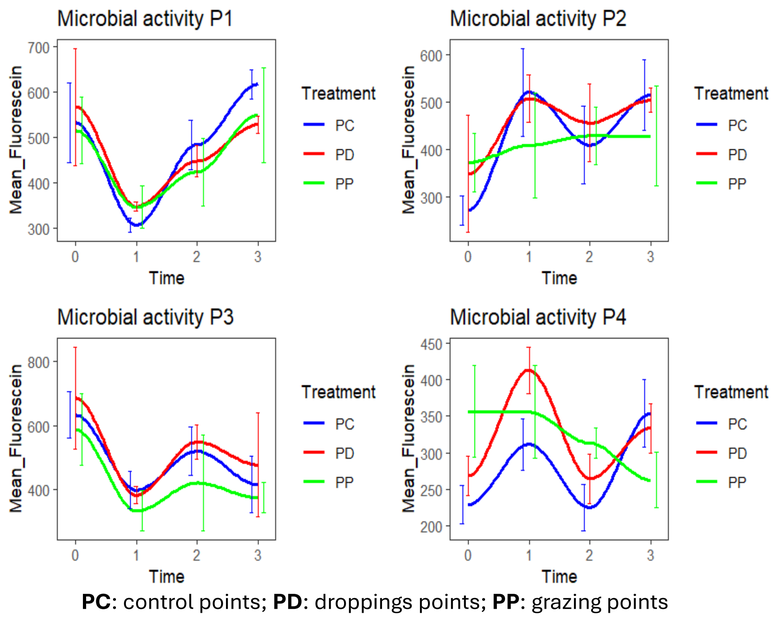


Figure 4: Different activities to carry out during the study

RESULTS AND DISCUSSION

- The initial results obtained show a tendency for soil microbial activity to change over time (0, 1, 2 months after deposition) in the presence of dung.
- No differences observed between treatments, but important differences were observed between meadows.
- The results showed changes in soil chemical composition over time in the presence of dung.



PC: control points; **PD**: droppings points; **PP**: grazing points

Figure 5: Soil microbial activities in four temporary grasslands under droppings

CONCLUSION

The presence of sheep droppings impacts microbial life and the chemical composition of the soil.

A more detailed analysis of the data will be carried out using metagenomic analysis with DNA sequencing to highlight the diversity and abundance of the microorganisms under the presence of droppings and urine.

The impact of droppings and urine on biomass and as well as sheep behavior will be investigated.

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