



NORSØK

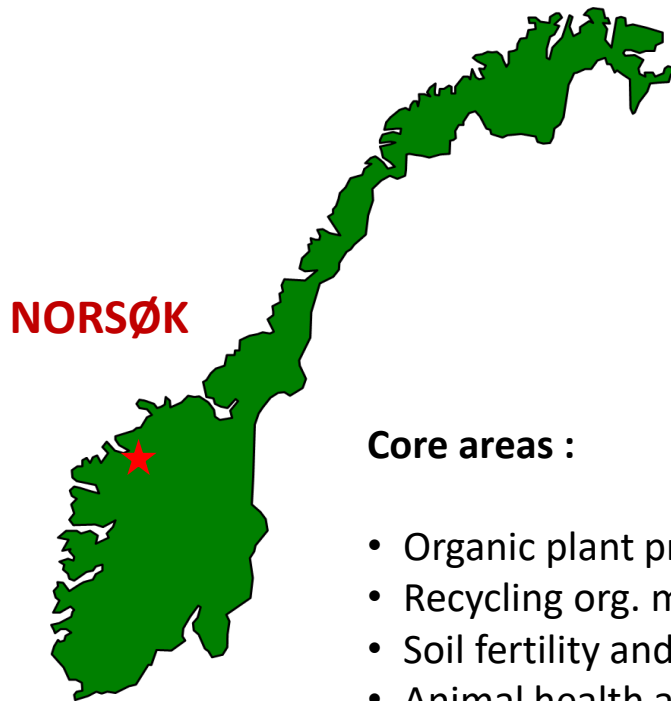
Norsk senter for økologisk landbruk

# Assessing on-farm soil health indicators under Norwegian conditions

*Tatiana Rittl, R. Pommeresche, NORSØK*

ADS EJP 12-14 June 2023

# Norwegian Centre for Organic Agriculture (NORSØK)



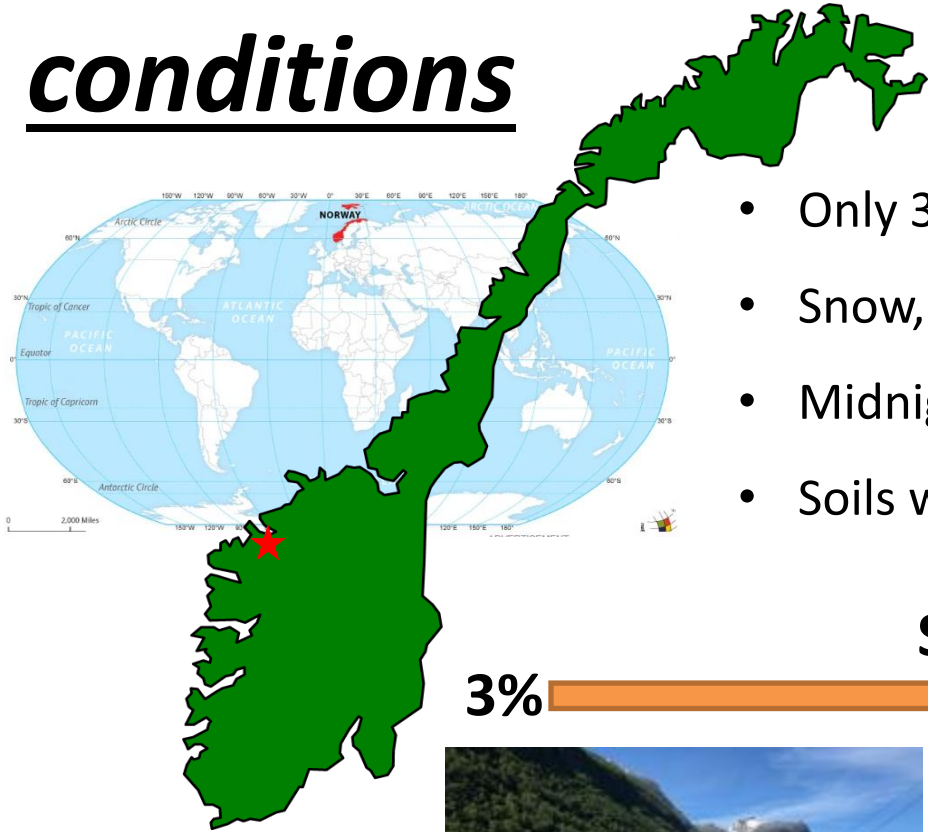
## Core areas :

- Organic plant production
- Recycling org. materials
- Soil fertility and health
- Animal health and welfare
- Climate effects of agriculture





# On-farm soil health indicators under Norwegian conditions



- Only 3% is agriculture land.
- Snow, freeze-thaw cycles.
- Midnight sun, dark winters.
- Soils with high content of SOM, but not always.



# Soil health in different agricultural “habitats”

## Organic milk farm

grass-clover (GC) ley in different ages and permanent pasture



## Conventional potato field

residual effect of different organic materials







# Indicators



- Carbon content
- Active carbon
- Soil respiration
- Earthworms
- Plant residues
- Cotton cloth
- Tea-bag
- Soil structure
- Aggregate size
- Aggregate stability
- Root depth
- Penetration depth
- Infiltration
- Pore Volume
- Bait lamina
- .....



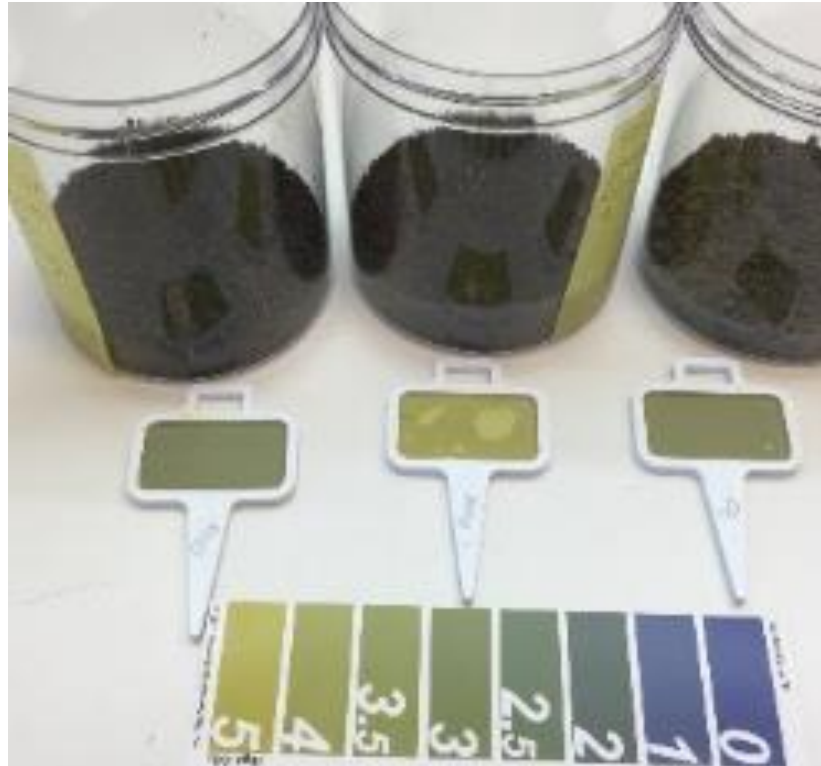
# On-farm soil biological indicators



- Soil respiration
- Feeding activity
- Soil microbiology

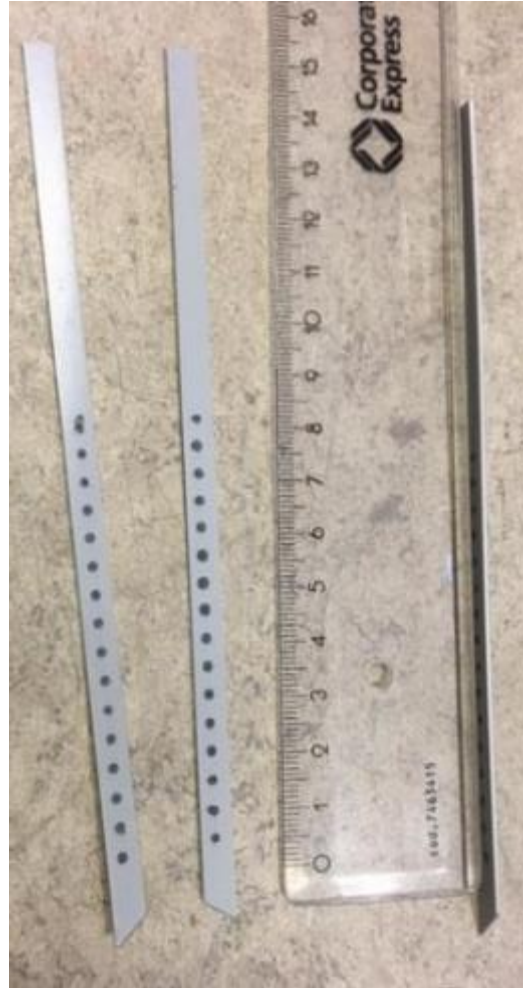
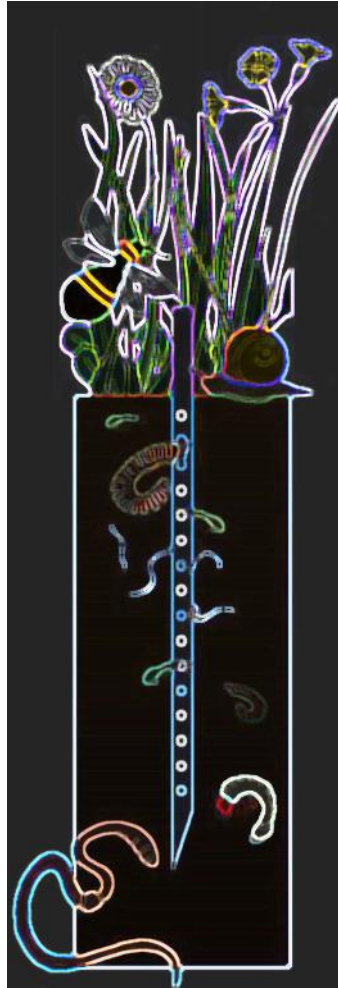


# Soil respiration





# Feeding activity



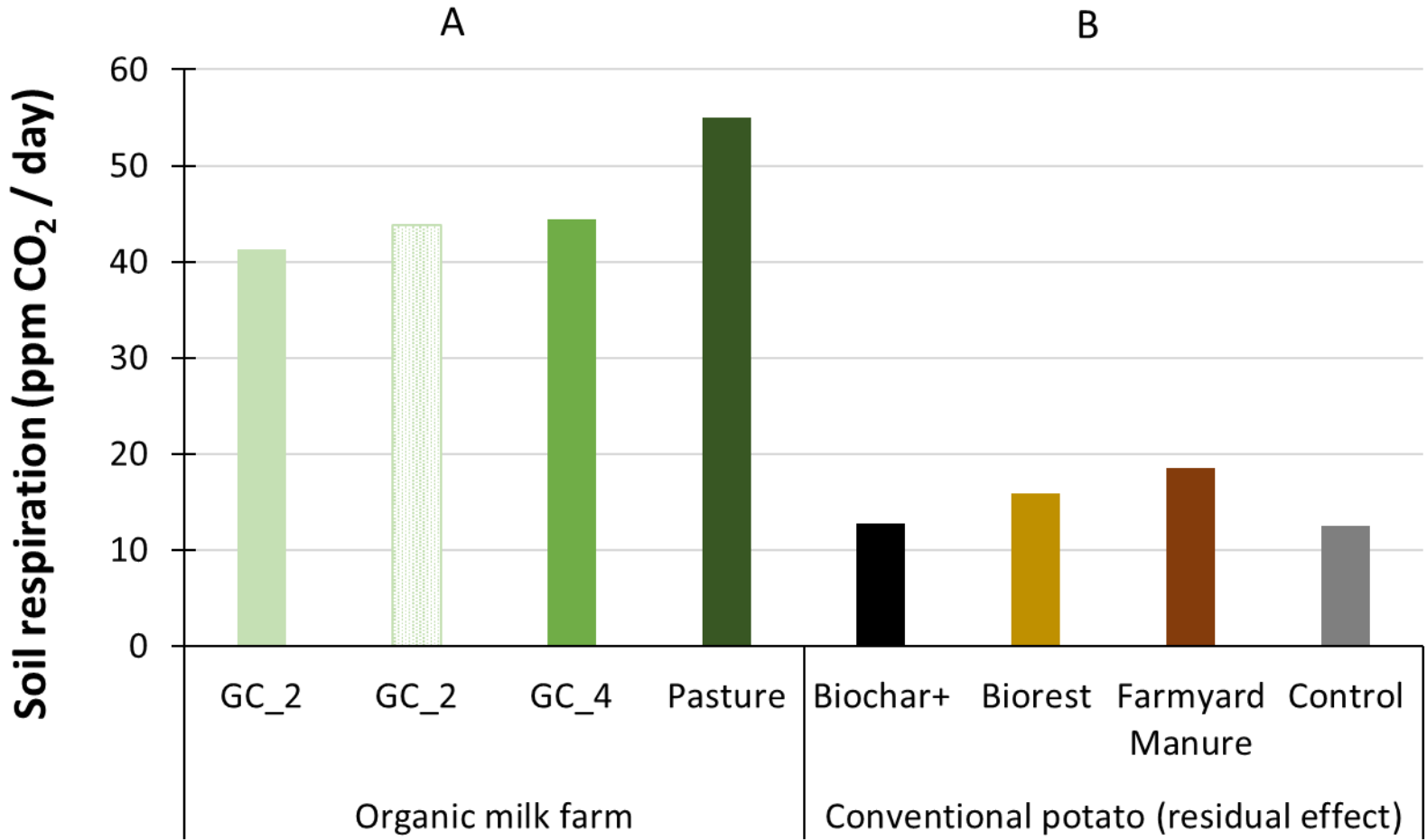


# Soil microbiology



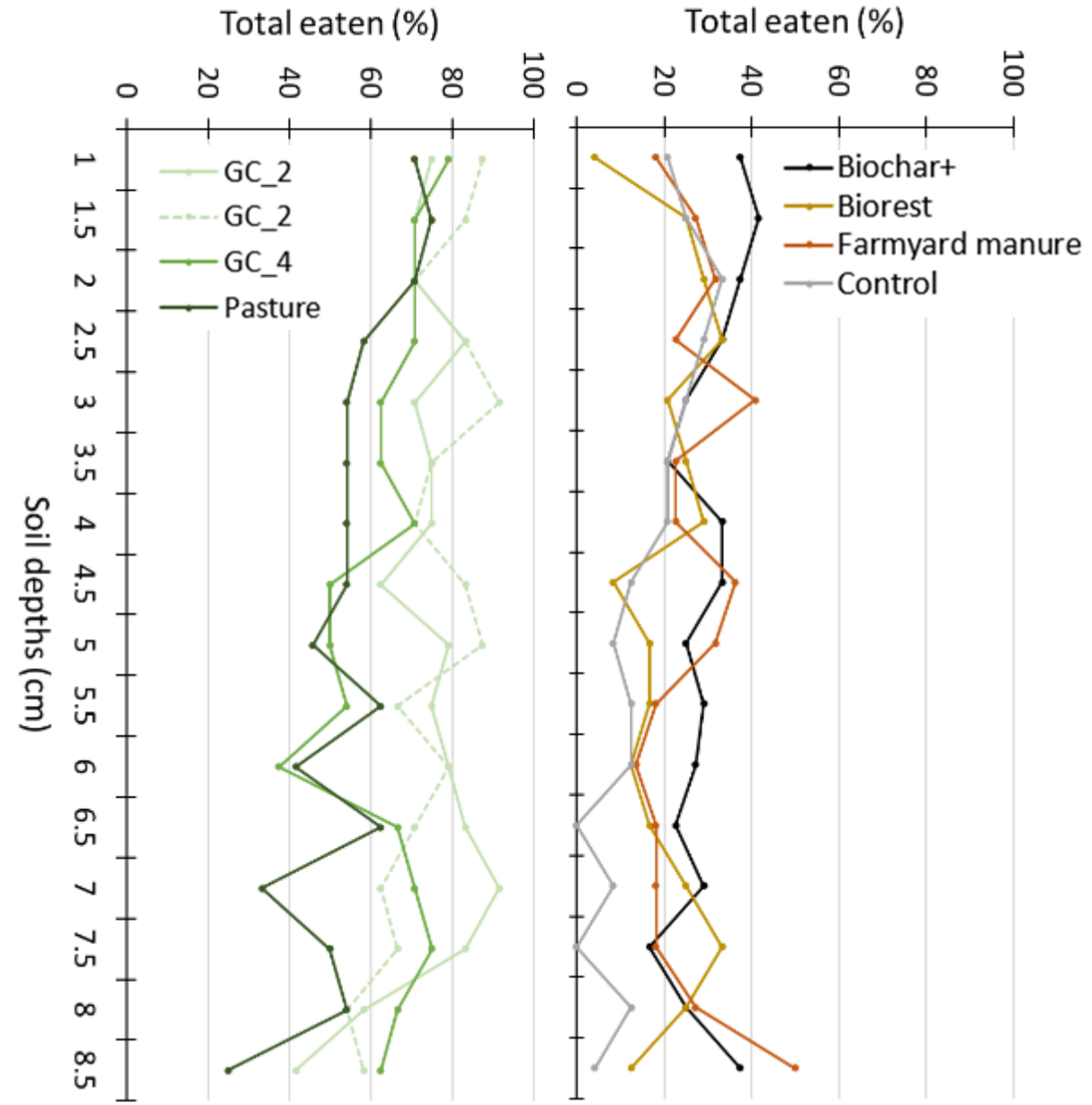
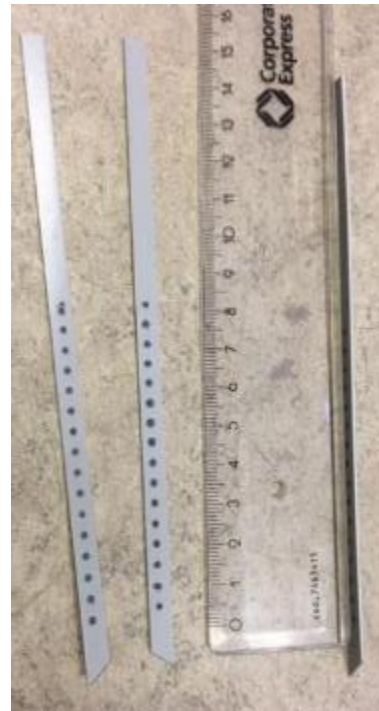
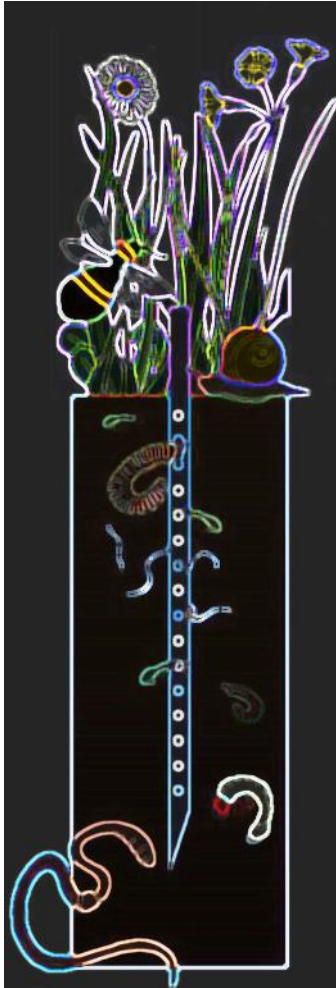


# Soil respiration



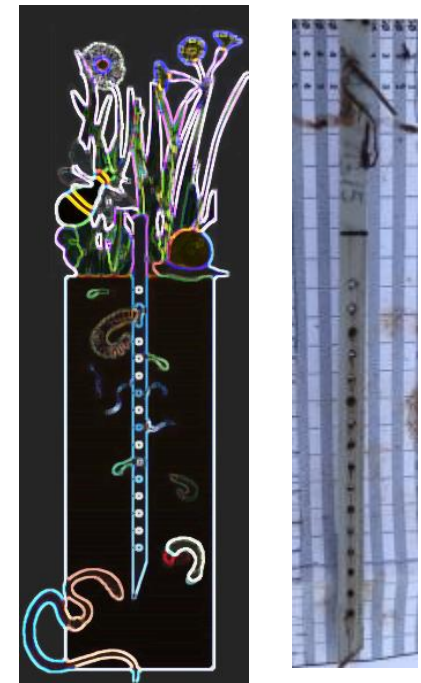
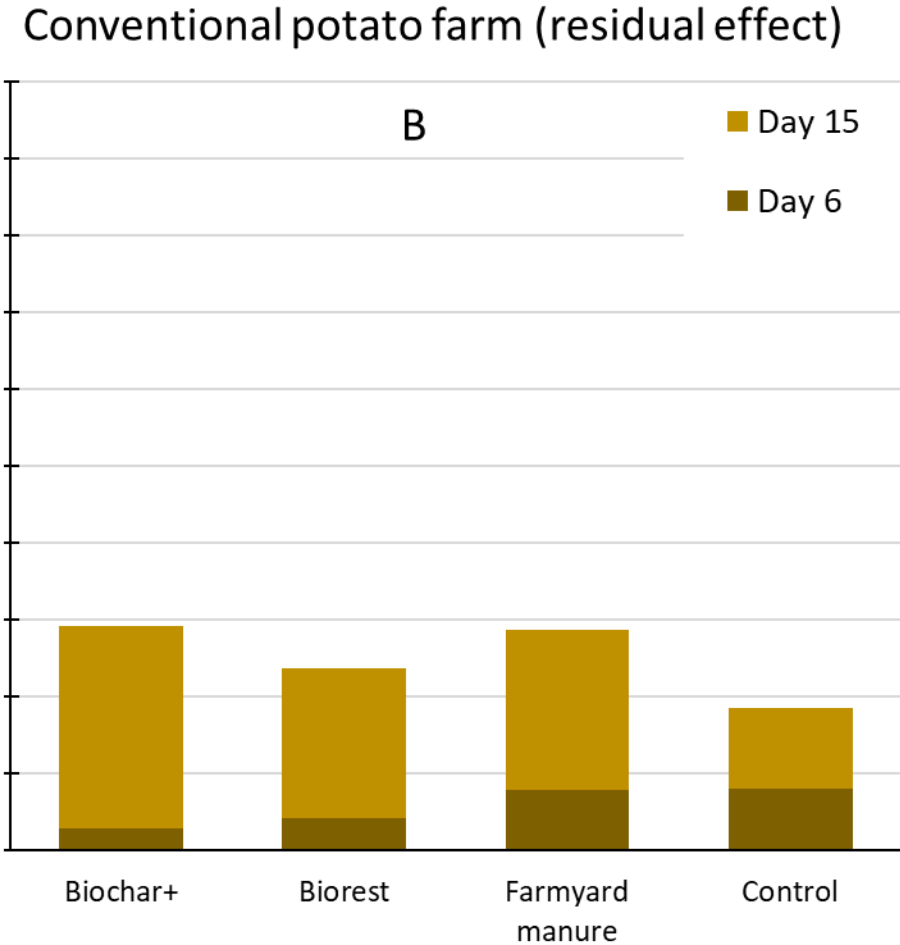
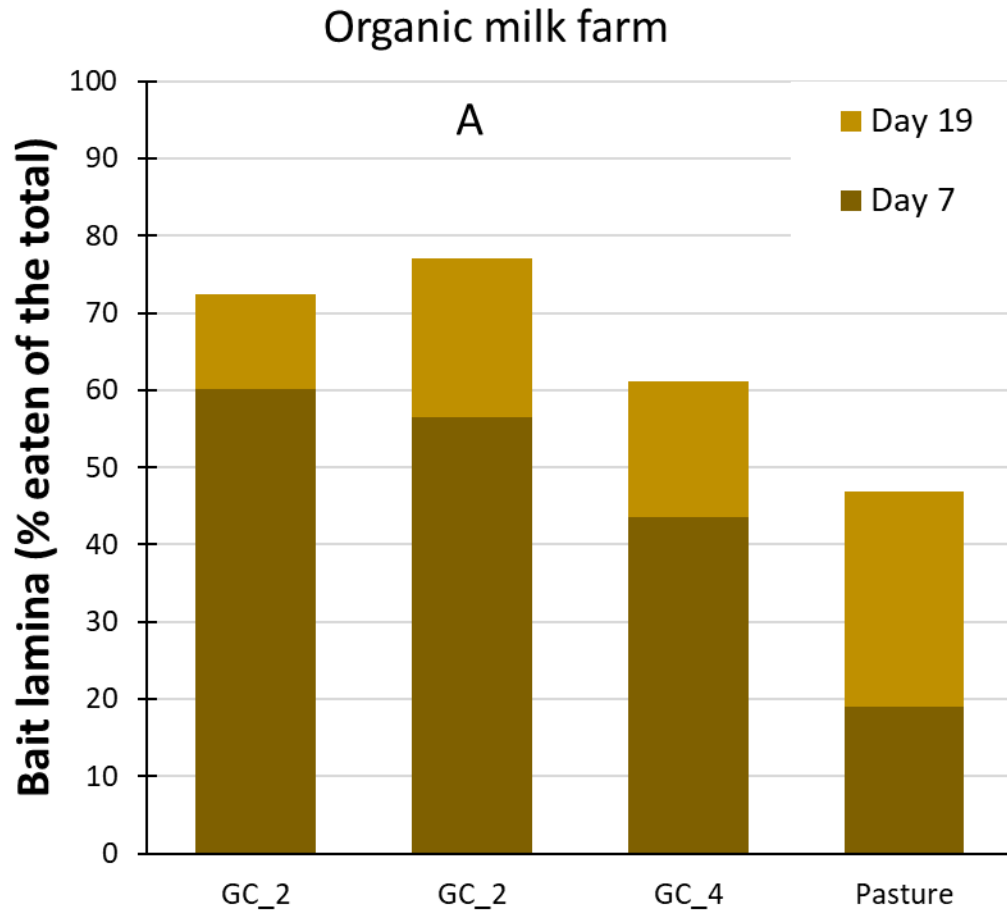


# Feeding activity

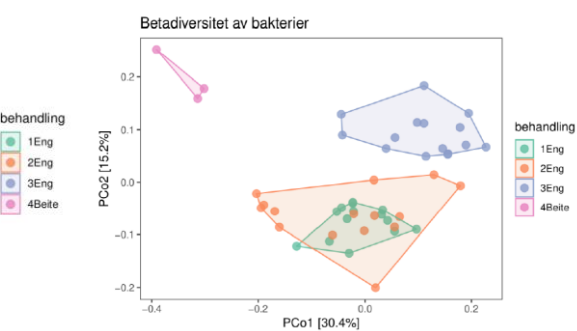
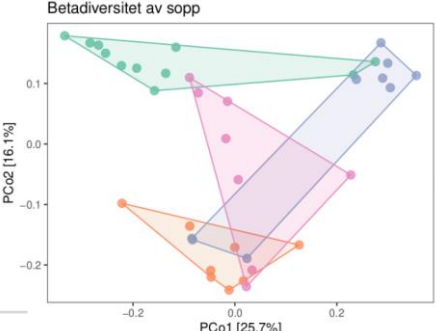
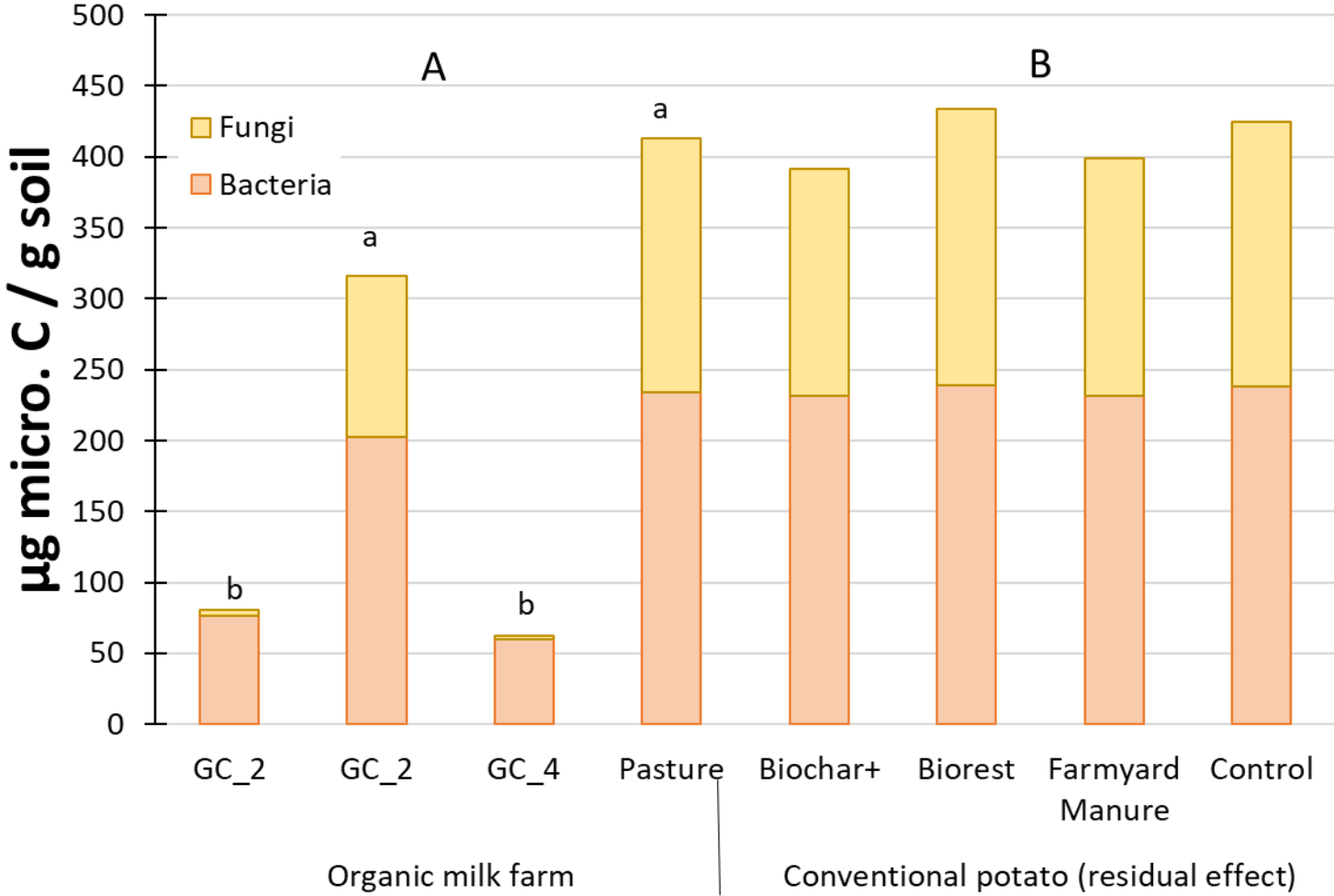




# Feeding activity



# Soil microbiology





# Inform



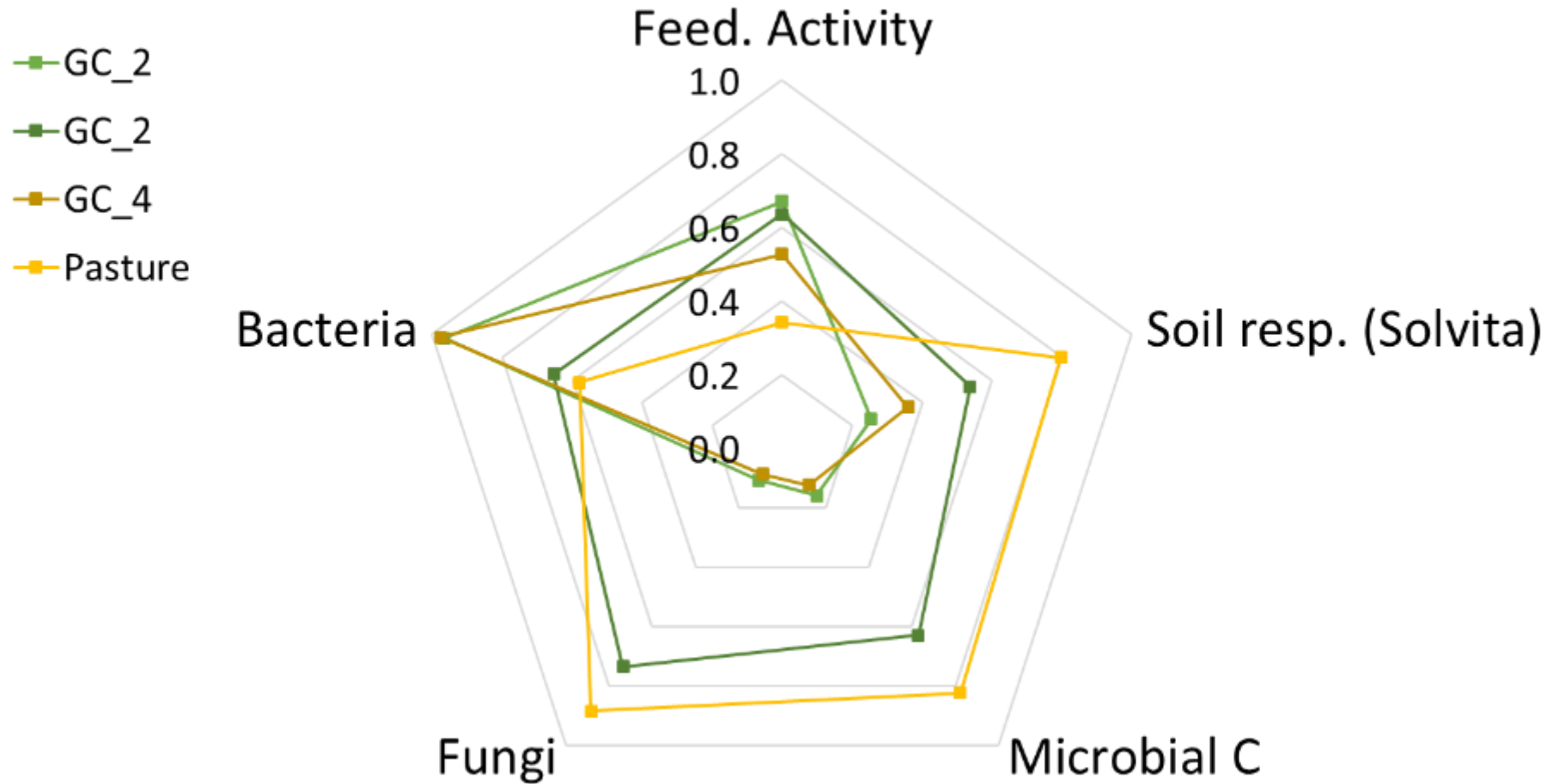
Soil health  
indicator  
potential =

Indicator value

---

Max. value  
for the indicator in farm

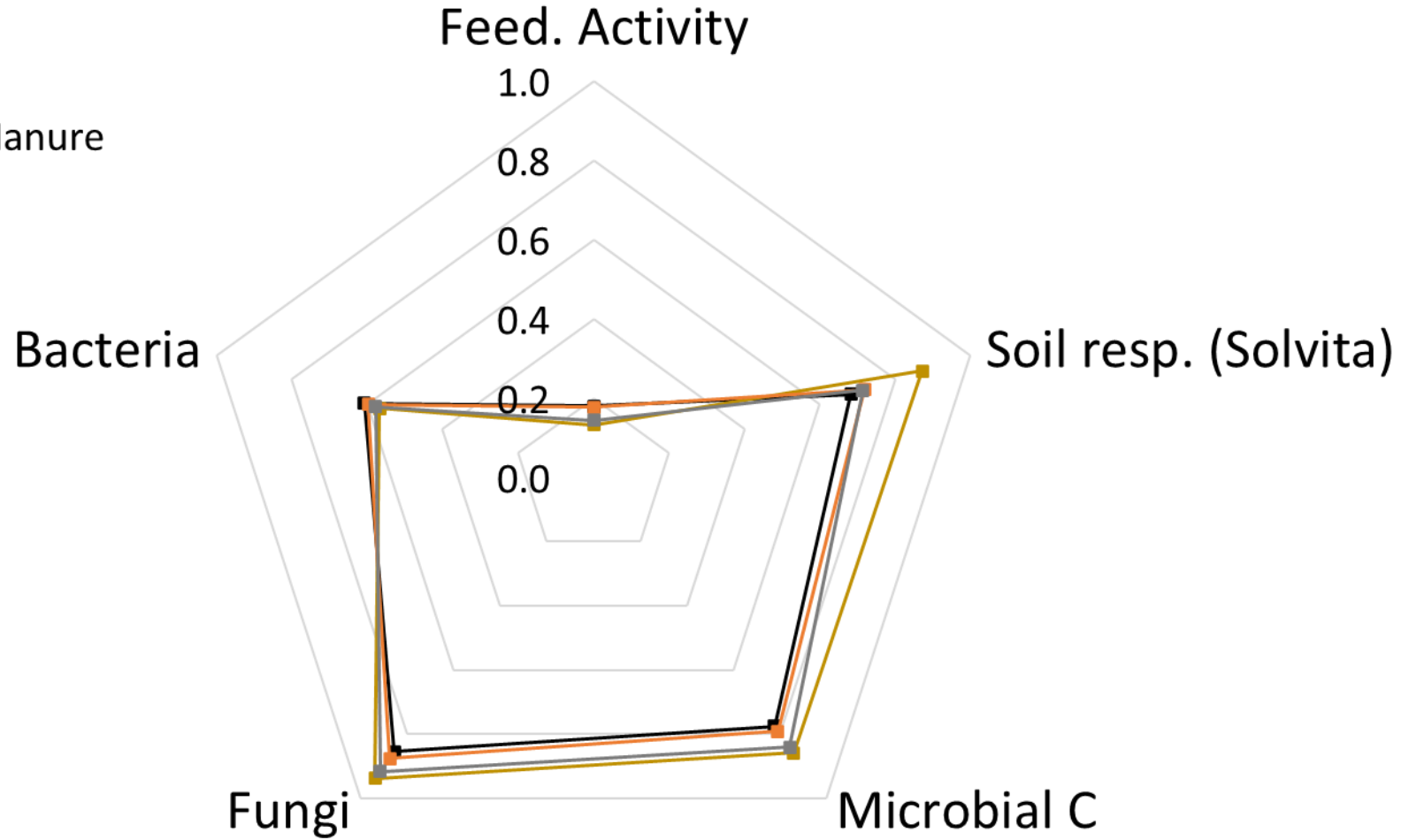
# Organic milk farm





# Conventional potato farm (residual effect)

- Biochar+
- Biorest
- Farmyard Manure
- Control

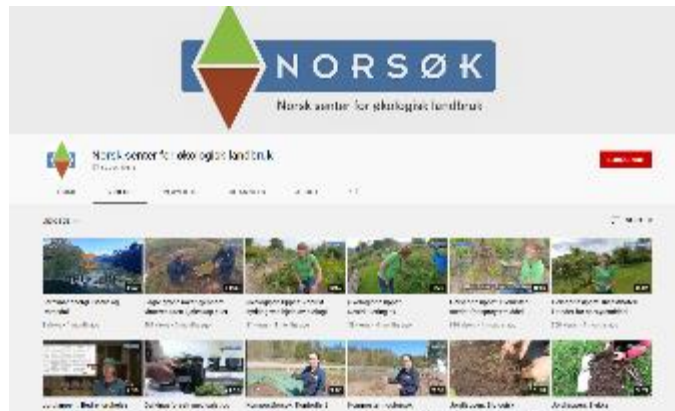


# Conclusions

- Tests **significantly differentiate between organically milk farm and conventional potato field**, with the first showing better values for soil health.
- Tests **do not always differentiate between areas/treatments** within the production systems.
- In the organic milk farm, **permanent pasture showed a trend of better soil health** than cultivated areas.
- In the conventional potato field, selected soil health **tests were not sensitive to capture the residual effects** of the organic amendments, and untreated and treated soil showed very similar values.
- The **visualization of the high potential level is a valuable approach to inform farmers and advisors about soil health.**



# Thank you!



More info:

<https://www.norsok.no/>

<https://www.youtube.com/channel/UCyq6x7OFN83nIPP9518OoDg/videos>

<https://orgprints.org/id/eprint/43527/>



Tatiana F. Rittl

tatiana.rittl@norsok.no