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# Polish study site experiment: EFFECTS OF LIMING, MANURE AND COVER CROPS ON CROP YIELDS



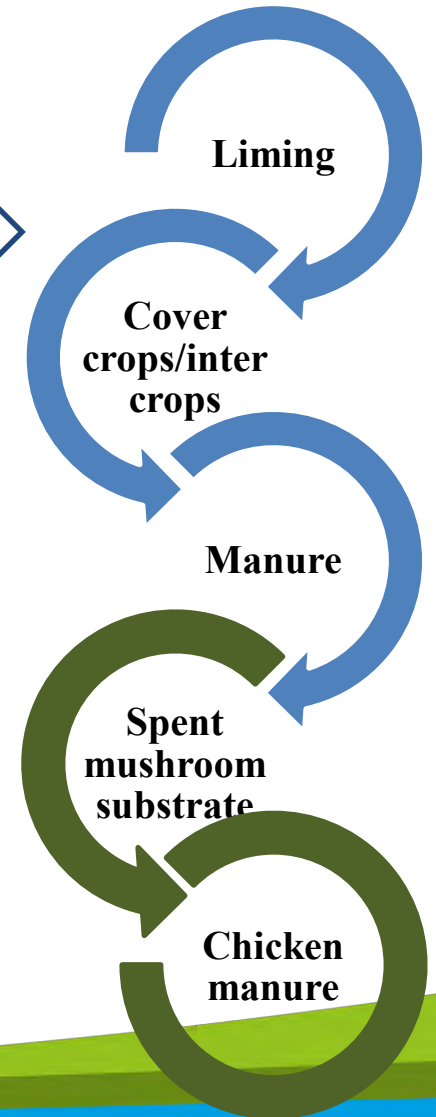
Szaniawy



Soil management practices

## Soil challenges to avoid losing crop productivity

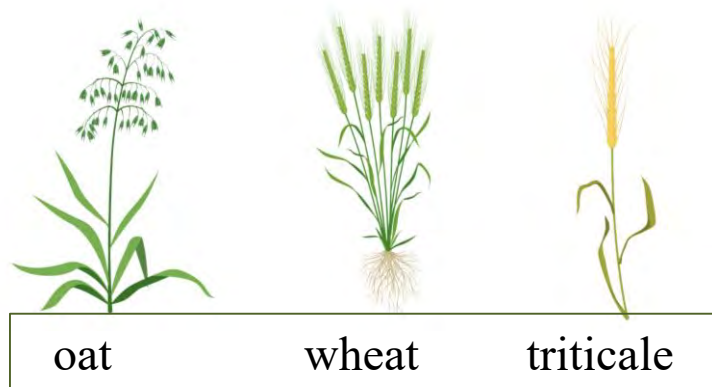
- Increase soil organic matter
- Increase water holding capacity
- Decrease soil acidity
- Increase legumes incorporated into cereal rotations to improve soil structure and N fixation



Treatment no.	Treatment
1	Control
2	Liming ( $\text{CaCO}_3$ , 5-6 t/ha)
3	Cover crops/intercrops
4	Manure (30 t/ha)
5	Liming/cover crops/manure



## CROP ROTATION



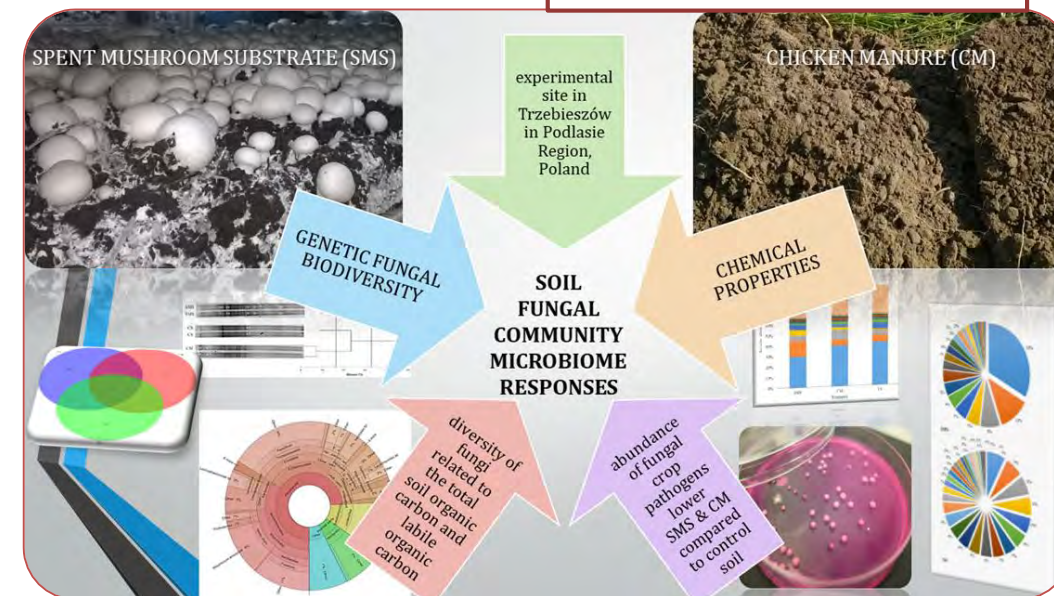
## The proposed solution & Experimental design



### Measurements

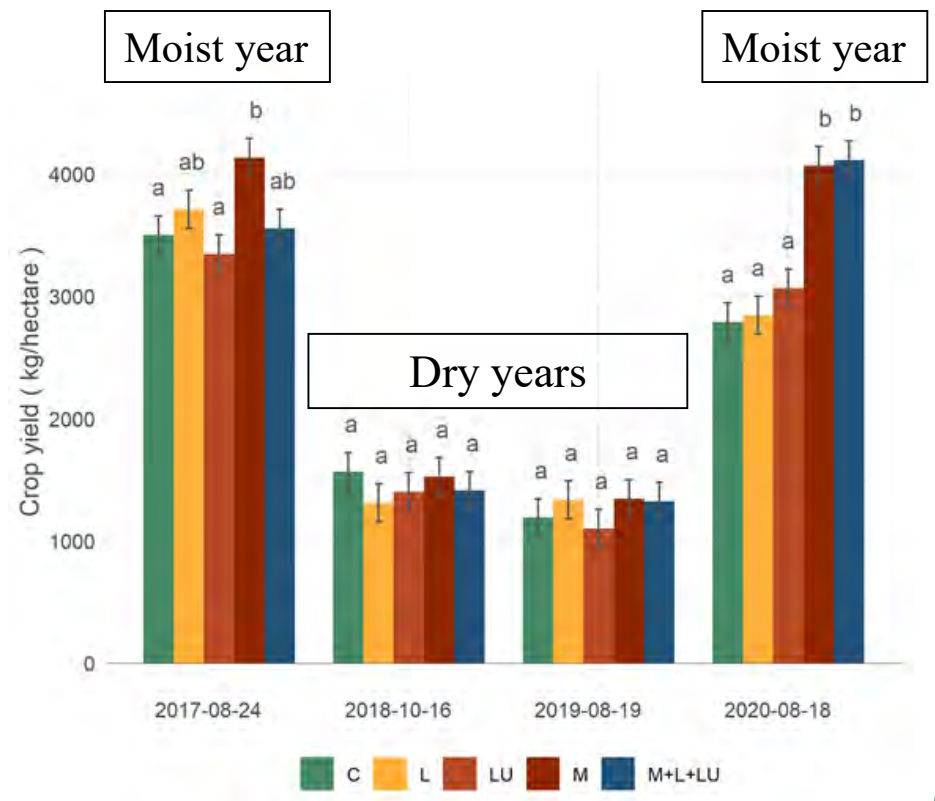
- Visual examination of the soil, including roughness, aggregate stability, soil cover and infiltration
- Precipitation
- Air temperature
- Soil texture
- Bulk density
- Soil water content
- Total porosity
- Thermal properties

### Additional experiment

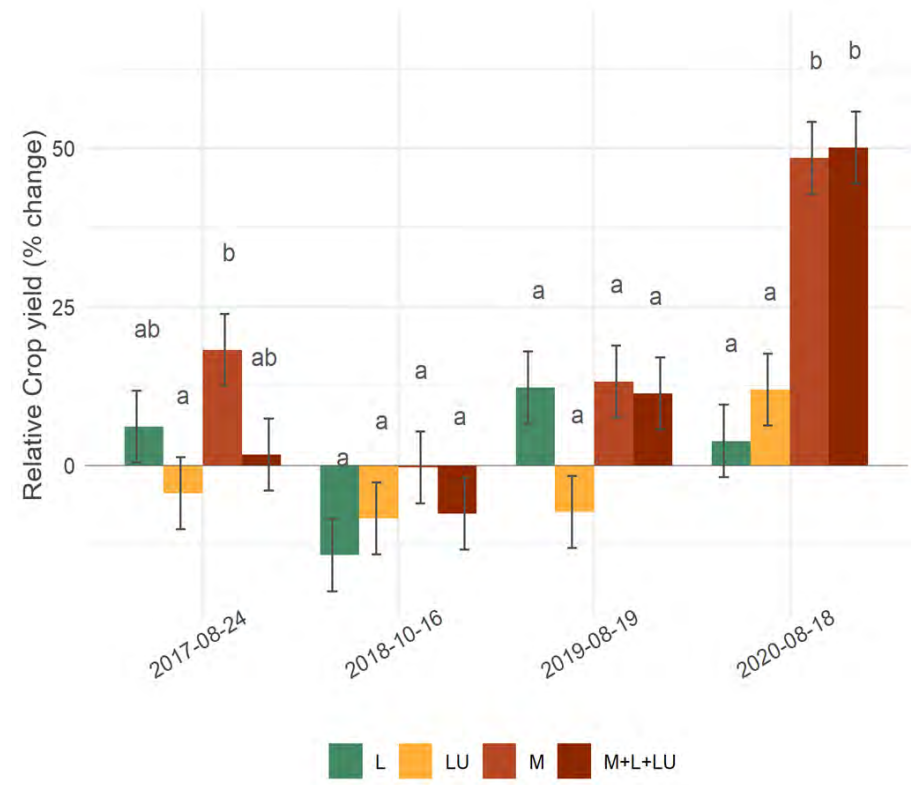




# RESULTS: EFFECTS OF LIMING, MANURE AND COVER CROPS ON CROP YIELDS



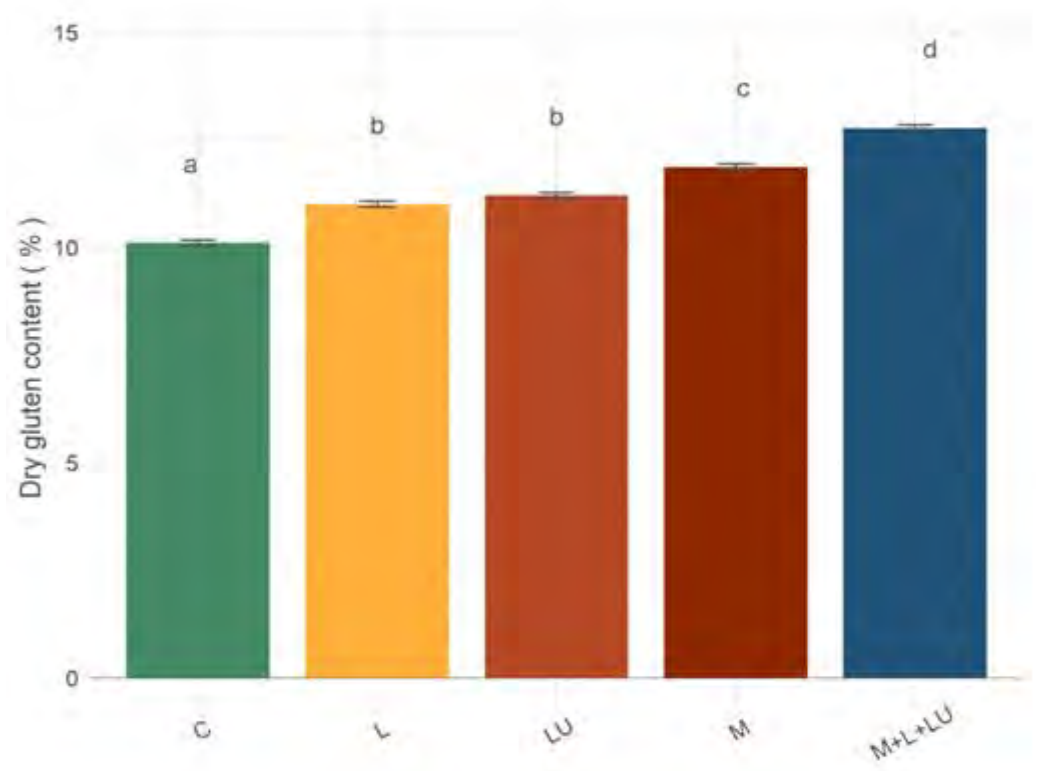
Mean values of crop yield



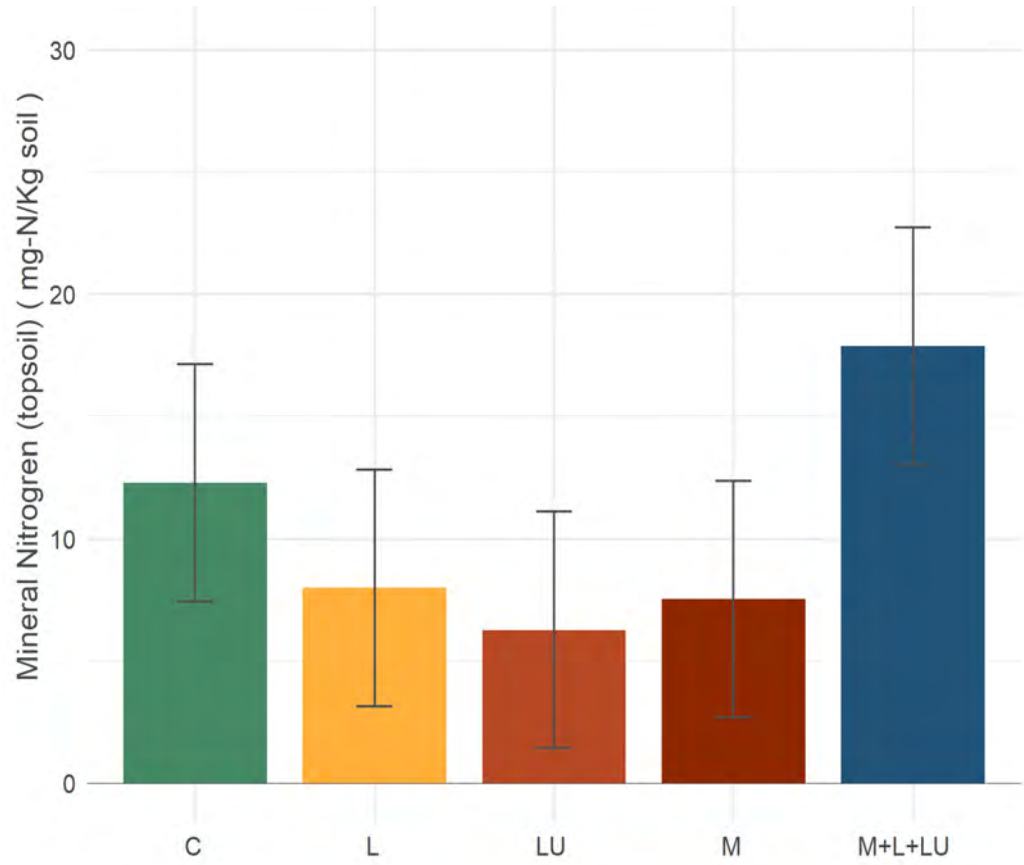
Relative crop yields



# RESULTS: EFFECTS OF LIMING, MANURE AND COVER CROPS ON CROP YIELDS



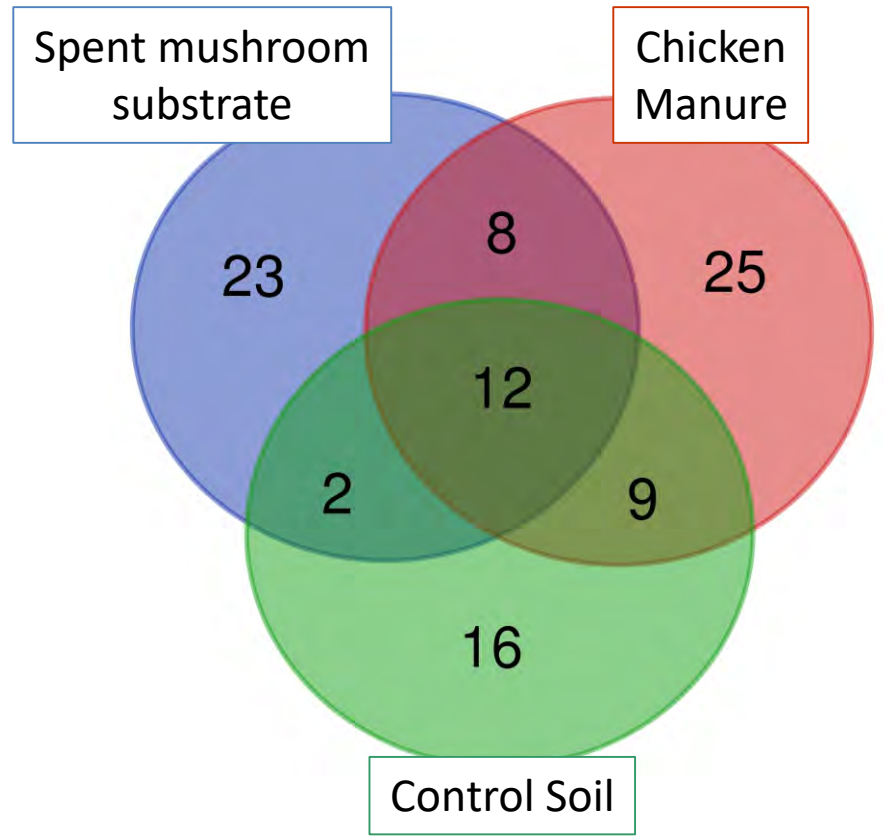
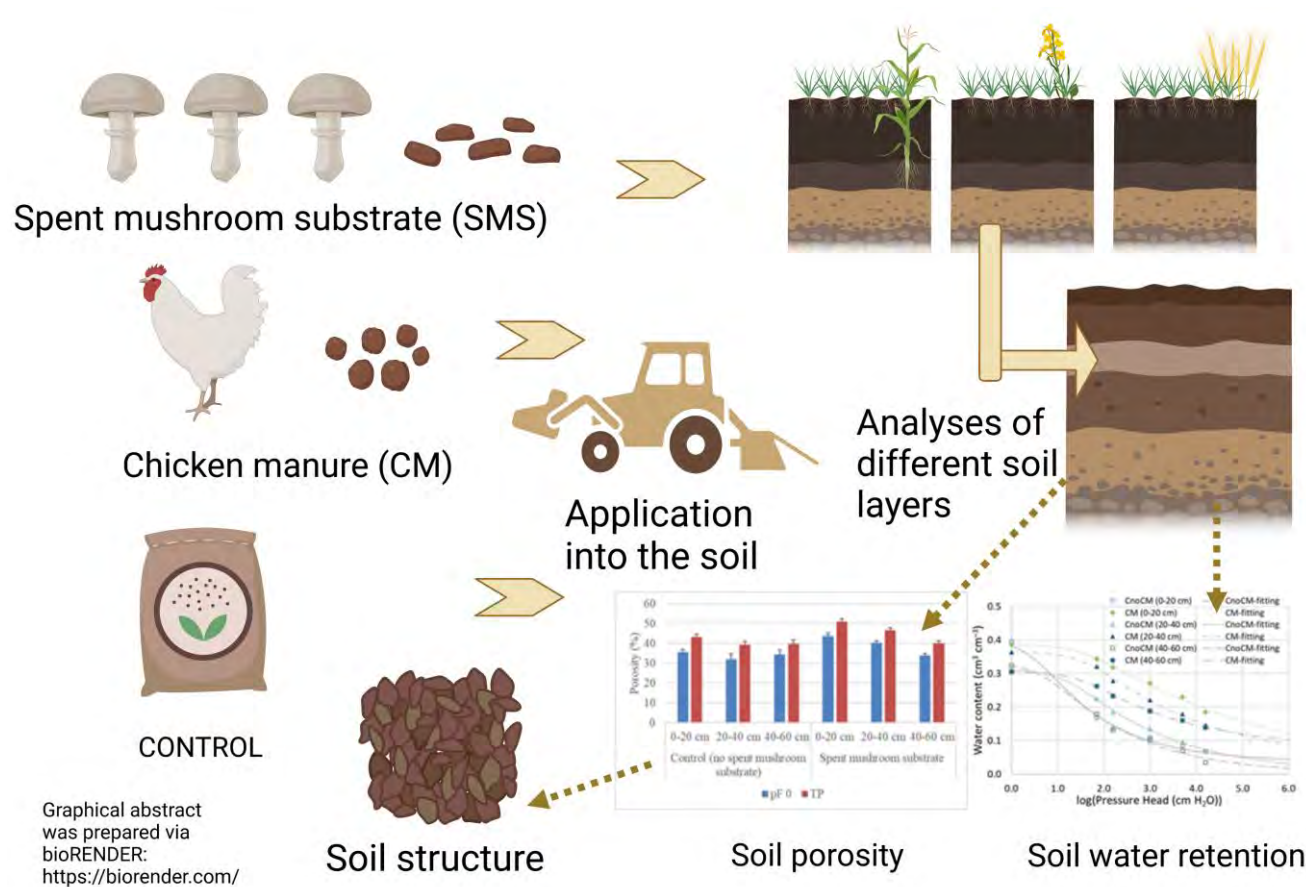
Dry gluten content in wheat kernels



Content of mineral nitrogen in the topsoil at harvesting 2020

- C – control
- L – liming
- LU – cover crops
- M – manure
- M+L+LU – manure + liming + cover crops

# RESULTS: EFFECTS OF SPENT MUSHROOM SUBSTRATE AND CHICKEN MANURE ON SOIL STRUCTURE AND BIODIVERSITY



↑ SOIL STRUCTURE = ↑ SOIL ORGANIC MATTER = ↑ BIODIVERSITY



# Factors promoting or preventing Soil Improving Cropping Systems (SICS) implementation

## Promoting factors



- Better water storage
- Nutrients supply from cover crops
- Fixing nitrogen from the atmosphere
- Demonstration farms

## Preventing factors



- Financial support needs
- Short-term effect not profitable







# SoilCare

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