Does Earthworm Enhancement lead to changes in Glomalin content in soil?

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What is glomalin?

Better to say glomalin-related soil protein

- **Discovered by Sara F. Wright in 1996**
- **Glycoprotein produced by arbuscular mycorhizal fungi**
- **Mostly produced by *Glomaromycota***

Why glomalin?

Soil quality indicator

- **Relatively easy extraction** (as compared to humic/fulvic acids)
- **Responsible for stability of soil aggregates**
- **Can suport carbon sequestration**

What were we expecting?

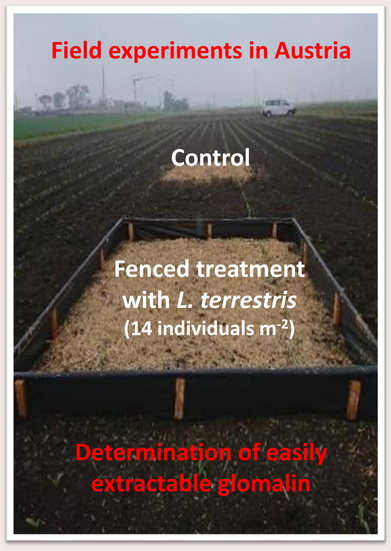
1. Earthworm (*Lumbricus terrestris*) enhancement supports the microbial activity and reproduction of glomalin producing fungi
– the glomalin content will increase

2. Earthworm enhancement supports the microbial activity responsible for mineralization
– the glomalin content will decrease

3) Combination of both hypothesis will lead to no effect on glomalin content

Materials and methods

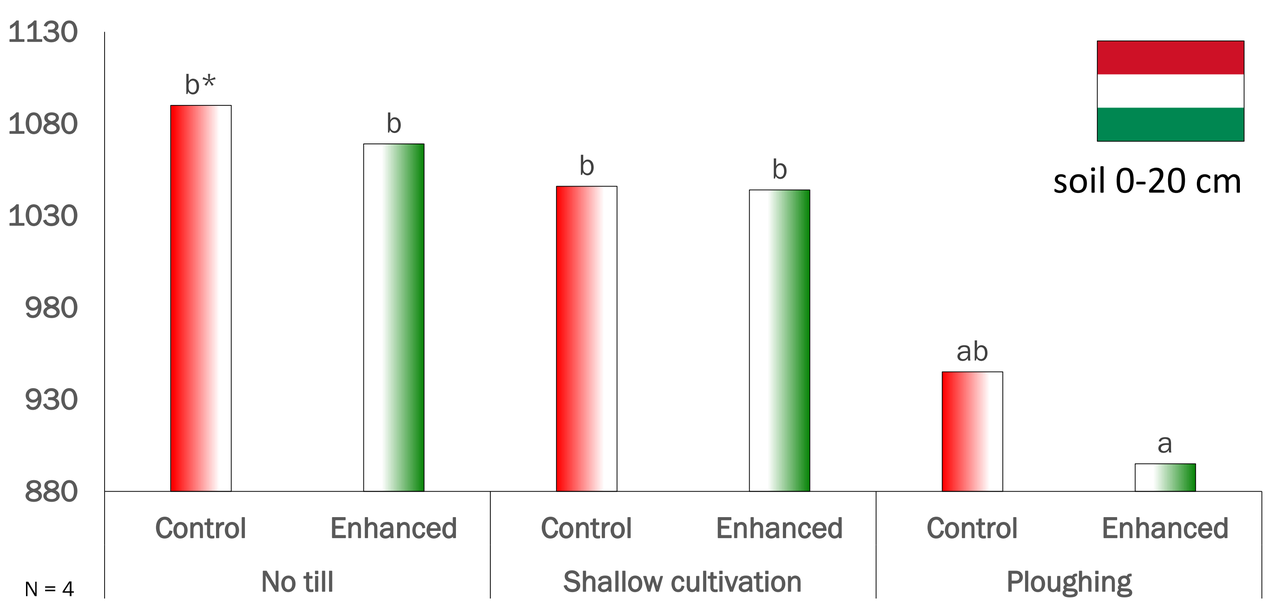
3
- Field experiments
- Soil-climatic conditions
- Tillage systems



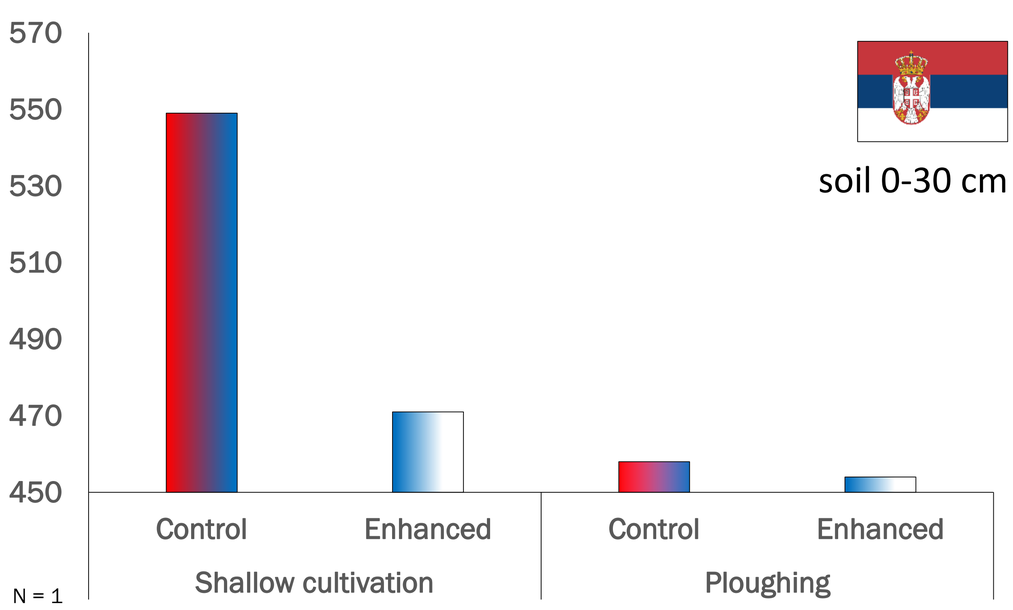
Results

Content of glomalin (mg kg^{-1}) in Austria after maize harvest

Content of glomalin (mg kg^{-1}) in Hungary after sunflower harvest



Content of glomalin (mg kg^{-1}) in Serbia after maize harvest



**Treatments having no letter in common are significantly different (Tukey test, $p<0.05$)

Conclusions

The content of glomalin usually decreased in order: *No till* > *Shallow cultivation* > *Ploughing*
Soil tillage seems to have bigger effect on glomalin content changes as compared to earthworms

The second hypothesis seems to be more reliable:
Earthworm enhancement probably led to supporting mineralization processes and so to the decrease of glomalin content in soil

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