

Background

- **Relay intercropping** is a type of system in which two or more crops grow simultaneously during part of the life cycle of each.
- The dynamics of **arbuscular mycorrhizal fungi (AMF)** within the root rhizosphere network as influenced by intercropping is largely unexplored.
- The contribution of AMF in enhancing the crop's **agronomic performance** in intercropping cannot be overlooked.

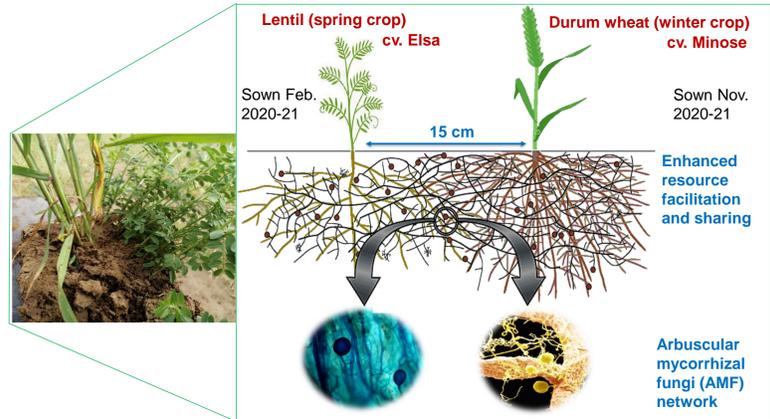


Fig. A synchronized growth of durum wheat (sown in winter) relay intercropped with lentil (undersown in spring) can enhance root AMF interactions and resource use efficiency (RUE).

Aims of the Study

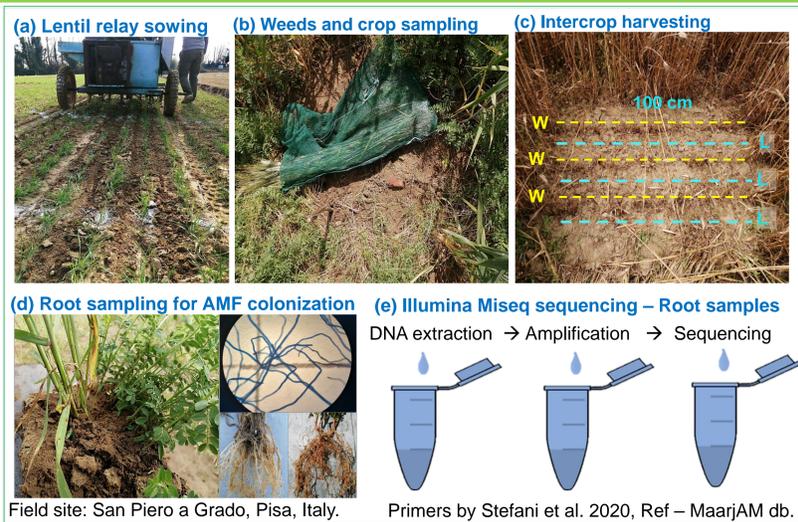
- To evaluate the effect of relay intercropping durum wheat (winter crop) with lentils (spring crop) on:

- 1) Weed control
- 2) AMF diversity & composition
- 3) Overall crop yield
- 4) Contribution of AMF on crop productivity

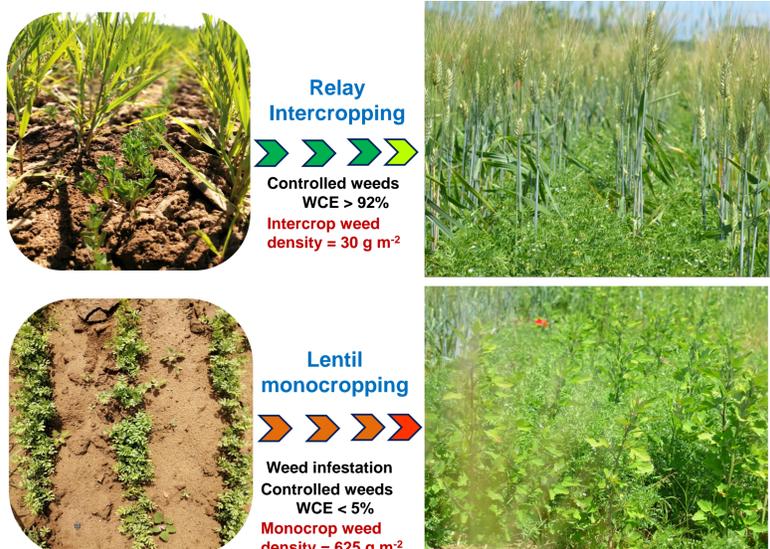
Comparing

- a) Crop Stand Types i.e.**
Sole crop vs. Intercrop (Mix)
- b) Target Plant Densities i.e.**
High: 100% Mix (350 W. plants m⁻² + 180 L. plants m⁻²)
vs.
Low: 33% Mix (116 W. plants m⁻² + 180 L. plants m⁻²)

Materials and Methods

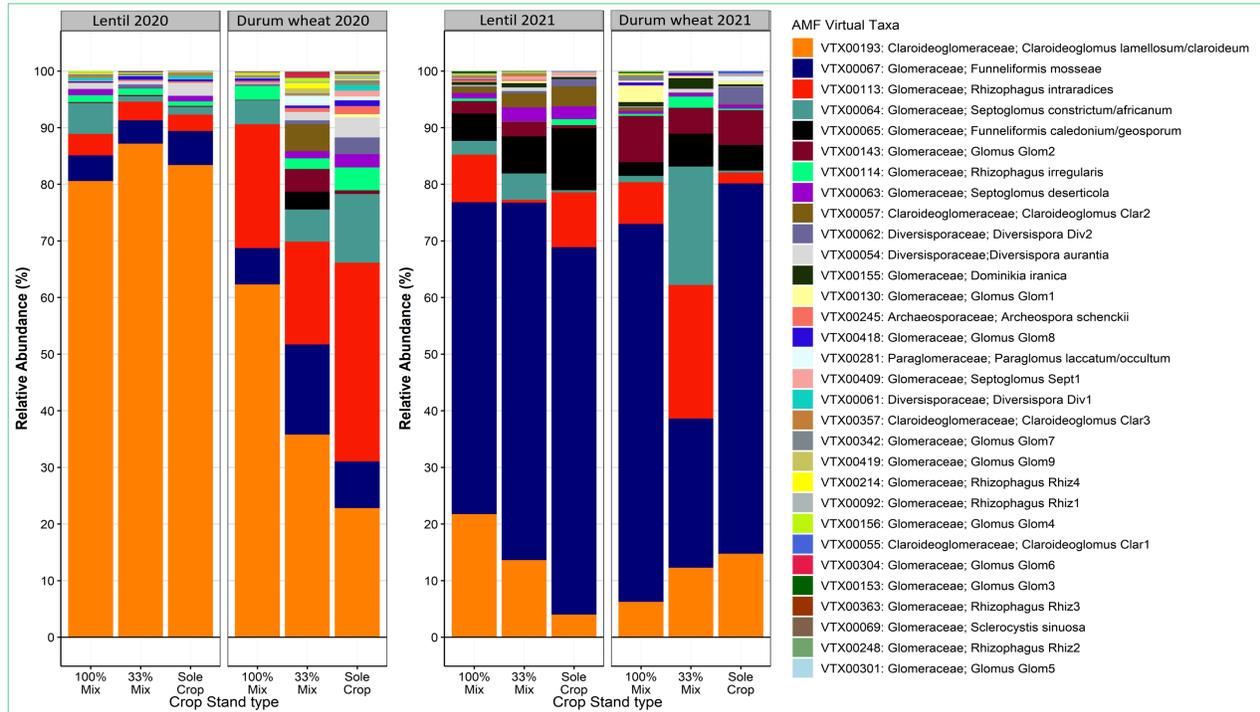


Results 1 – Weed Control Efficiency (WCE)



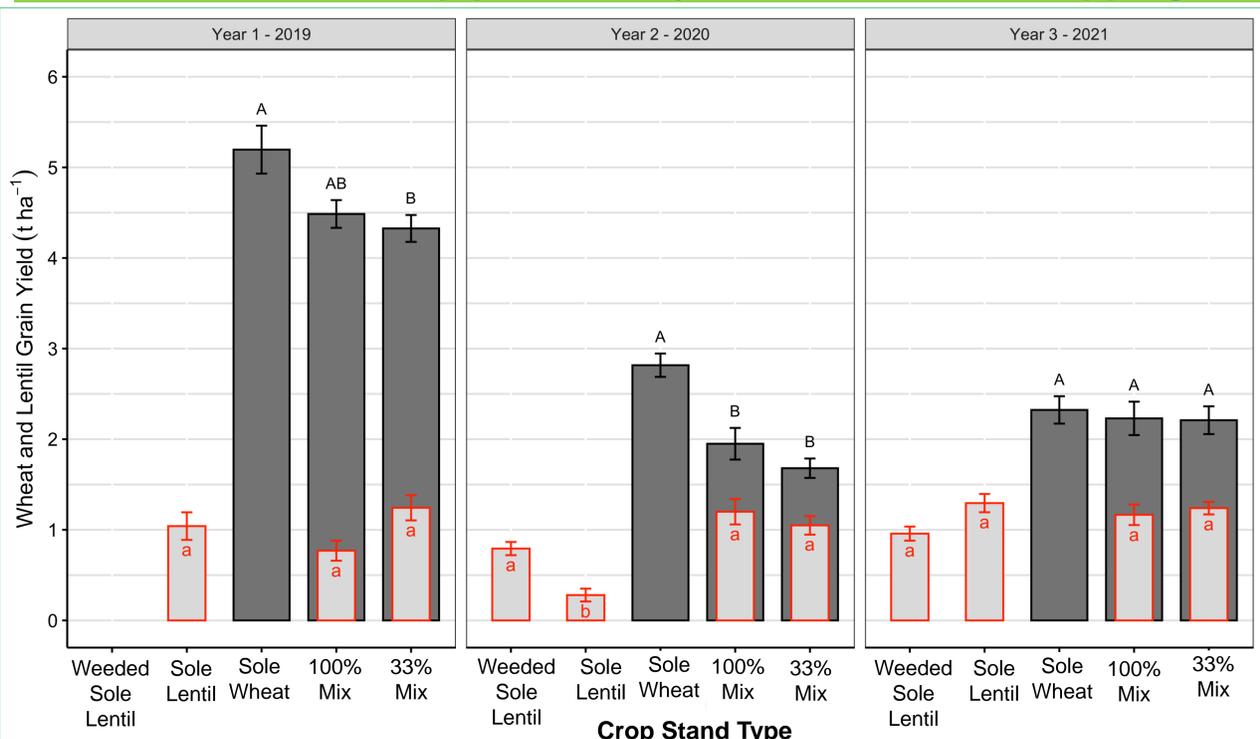
Results 2 – Illumina Miseq Sequencing of Root Samples

- AMF composition and abundance differed according to crop type and year, not intercropping.



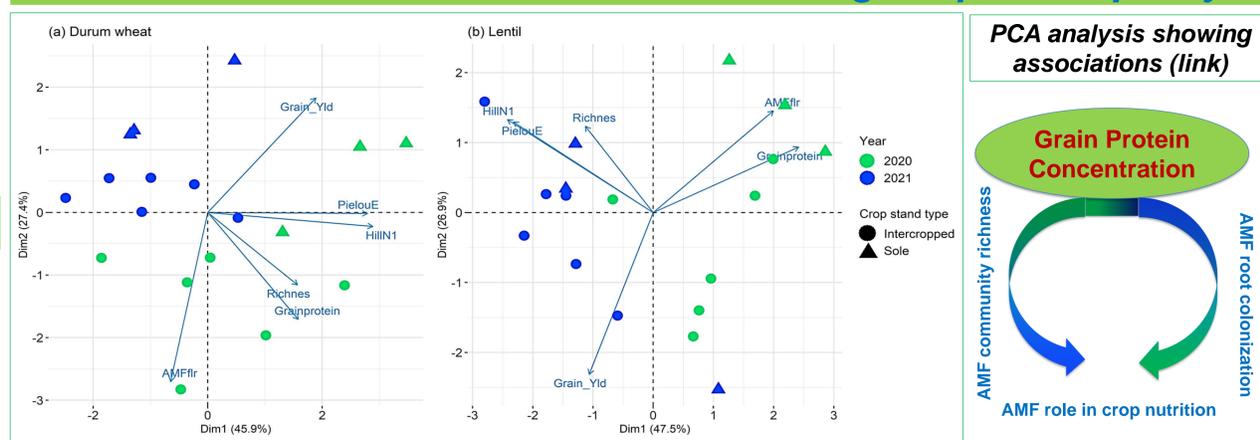
- **Glomeraceae** and **Claroideoglomeraceae** were the most abundant but had contrasting abundances in 2020 and 2021.
- Overall changes in AMF diversity and community structure were affected by crop species x year (field), not by intercropping.

Results 3 – Overall crop productivity stabilized in intercropping



- Both intercropping densities (100% Mix & 33% Mix) achieved an overall yield advantage (LER > 1) compared to sole crops.

Results 4 – AMF associated with wheat-lentil grain protein quality



Conclusion and Perspectives

- Relay intercropping is not only a promising practice for increasing the **overall yield stability** compared to sole cropping but also in enhancing **crop nutrition**; thanks to its **weed control efficiency** and influence on **mycorrhizal activity**.
- **Below-ground biodiversity** as a factor of production needs to be explored further.