



## Soil carbon stock in olive groves agroforestry systems under different management and soil characteristics

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Agriculture and land use changes play a key role in atmospheric CO<sub>2</sub> emission and fixation, especially by affecting the soil C storage. Agroforestry systems can contribute to climate change mitigation by increasing tree cover on agricultural land.

However, the amount of C stored as soil organic matter depends on several factors, such as soil characteristics and management practices. Olive groves are one of the most common land use practice in Mediterranean area. Therefore, it is important to investigate soil C stock in olive orchards, and to assess which agronomic practices could improve soil C sequestration. For this reason, a study has been conducted in Umbria Region, central Italy, analysing different olive groves, including conventional and organic management, and a typical silvopastoral agroforestry system, where olive cultivation is combined with sheep grazing. The high values of soil C stock indicate that olive could play an important role in soil C sequestration, comparable to that of natural forest ecosystems.

A slightly lower soil C stock was measured in the silvopastoral farm in comparison to the other farms, while high soil C stock resulted to be associated with the use of pomace as fertilizer. Finally, the evaluation of the soil C stock in the deeper soil layers turned out to be very important for the analysis, as they can store a considerable amount of C.

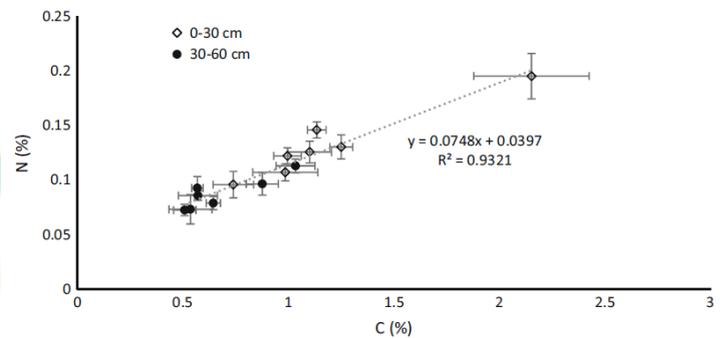


Figure 1 Relation between C and N content (%) in the upper soil layer (0–30 cm) and the lower soil layer (30–60). The regression line refers to the data from both soil layers pooled together.

### References

Camilla Bateni, Maurizio Ventura, Giustino Tonon, Andrea Pisanelli (2019). Soil carbon stock in olive groves agroforestry systems under different management and soil characteristics. *Agroforestry System*, 1-11.

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