



## Evaluation of the soil response of different types of pruning of chestnut tree

### Introduction

The aim of the Castagni Parlanti is to assess the ecological footprint of chestnut tree recovery in the current crop year with Tree Talkers within a forest matrix, in terms of carbon fixation and sequestration in the soil-plant system, water use and soil cover, drawing concrete indications for effective and sustainable forest management for the joint production of wood and fruit.

With regard to the evaluation of the soil response of different types of chestnut pruning, the Tree Talker data revealed advantages and disadvantages of the different forms of pruning proposed for chestnut restoration on small areas.

In the project, three pruning methods were therefore compared (in addition to an unpruned control) of different intensity, characterised by a different impact on plant shape and vitality and a different cost of implementation: strong pruning, intermediate pruning, low pruning.

Pruned plants reduce their water requirements compared to the control during almost the entire first vegetative cycle following pruning, and then align their water consumption to unpruned plants from the second year onwards. Considering that future climate change conditions foresee an intensification of prolonged drought periods, favouring pruning that has less impact on soil water status could be an adaptation strategy. Lighter pruning (light and medium pruning) ensured a higher C sequestration capacity through the canopy per unit area than more intensive pruning. However, this advantage disappeared at the end of the first vegetative cycle following pruning, in which all the plants subjected to different pruning intensities recovered their carbon sequestration capacity on a par with the unpruned ones, maintaining it throughout the second year.

Even the most intense pruning does not seem to have compromised the health of the plant canopies, showing transmitted NDVI values that align in the second season for all treatments. The great carbon uptake that occurred in the autumn is interesting: higher temperatures in autumn stimulate photosynthetic activity and delay leaf senescence, thus expanding the useful period for carbon sequestration.

## Lessons learned

Indicators calculated from the IoT sensor data have proven to be useful and reliable for monitoring plant health and determining the responses of chestnut trees to phenological cycles and different pruning treatments. The data analysis allowed a deeper understanding of the interaction between chestnut cultivation, forest management and the environment.

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## Further information

<http://www.castagniparlanti.it/>



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