

Improving soils in Portuguese Montado ecosystems

Portuguese operational group applies landscaping technique to Montado ecosystem for soil improvement

Many Montado ecosystems in Portugal are suffering from climate change. More frequent droughts and higher temperatures may result in loss of soil organic matter, which makes soils more prone to drought and erosion. This leads to loss of fertility and increases the risks of forest fires. An Operational Group from Portugal is developing a novel forest management practice to restore vitality and productivity.



The Montado is a cultural agroforestry landscape in Portugal and Spain characterised by cork oak and holm oak forests and pastures. The ECOMONTADO XXI Operational Group from Portugal identified loss of soil organic matter due to climate change in about 120 ha of the Montado in Portugal.

Ana Fonseca from the University of Évora is involved in the Operational Group: "The project is coordinated by the Agricultural Society of Freixo do Meio, with farmer Alfredo Cunhal Sendim in the lead. He came up with the idea to apply the Keyline design, which is an Australian landscaping technique. The technique is applied by a special plough and creates a water flow system to move water from wet areas to dry areas. The aim is to maximise rainwater infiltration in the soil and the decrease of erosion due to runoff. There is a higher level of humidity in the soil when infiltration increases and this will lead to a significant improvement of the fertility and structure of the ground. As the climate in Portugal is similar to the climate in Australia, this method is interesting to apply on our soils."

The University of Évora is monitoring different areas in 5 plots to understand if the Keyline approach is an advantage for the soil and the farms. An extensive monitoring plan for tree growth and soil has been set up. Every month, soil moisture, composition and texture are measured at different depths.

In addition to this monitoring, the University is also in charge of the dissemination of the results. The project partners realised that they needed an additional communication tool besides the website and Facebook page to better reach farmers. Ana: "We found out that the information that we disseminated was too abstract. Therefore, we decided to create a portable 3D Model that visualises how the Keyline method works. We showed this model to farmers during two real life meetings on a farm. Farmers were very enthusiastic and some of them immediately started using the technique on their land."

By the end of 2021, the OG will finish the project. Ana: "A delay in the definition and implementation of the monitoring parcels and in marking the Keylines, led to an extension of the data collection period until October 2021. The 2 participating farmers started using Keyline last summer, so it is too early for results. But what I can see, when measuring the soil moisture in the plots is that it responds very well to periods of rain. So, we are looking forward to confirming the first results!"



More information

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