



## Fertilization recommendations for cork oak

### Introduction

Although the cork oak is one of the main forest species and the national tree of Portugal, there was not much information about fertilization recommendations for the development of this species. The practice was to carry out soil analyzes only for the installation of under-cover pastures, forgetting the arboreal component of the system.

GO NUTRISUBER carried out the characterization of the soils of 30 cork oak forests and the monitoring of their fertility in the areas where the species occurs in greater density and where it is most economically exploited: Alentejo and Ribatejo.

The soil, in addition to the water and air it contains, is made up of mineral and organic particles of various sizes that give it different characteristics, depending on whether one or the other dominates and, within these, whether the finest or the coarsest. In Portugal, most soils are mineral, that is, mineral matter is dominant, with very few organic soils (with contents greater than 15% of organic matter). From the point of view of plant nutrition, only the finest particles, with dimensions smaller than 2 mm - the so-called fine earth - are considered, and this is the fraction that is analysed to assess the state of soil fertility. Some of the characteristics of the soil can be observed in the field, just by looking closely at its profile. Others, such as texture, organic matter and mineral nutrient content, reaction (pH) and cation exchange capacity, can only be evaluated through laboratory analysis.

In addition to soil analyses, this work demonstrates the importance of leaf analysis of nutrients for understanding the true state of nutrition of cork oaks to allow giving recommendations for fertilization. Methodologies for collecting soil and leaf samples were defined in order to obtain more efficient results, and dissemination videos were made for technicians and forestry producers.

### Lessons learned

The main result of this project was the creation of fertilization tables for different states of development of the cork oak forest stands: Stand installation phase; Young phase until the first stripping; Adulthood.

All the information was compiled in a manual on cork oak fertilization, which describes the physical, chemical and biological characteristics of the soils in the cork oak forests. In addition, it makes a simple description of the forms and availability of soil nutrients for plants, creating a table that classifies the forest stand in fertility class (very low, low, medium, high and very high) according to chemical parameters such

as phosphorus ( $P_2O_5$ ), potassium ( $K_2O$ ) and magnesium (Mg). At the end, it presents the mentioned fertilization tables with the recommended amounts of fertilizer to apply for a correct fertilization of the Montado. These tables are based on the previously mentioned fertility classes that resulted from the analysis of soil samples and foliar samples, defining the amounts of nutrients to be applied per hectare.

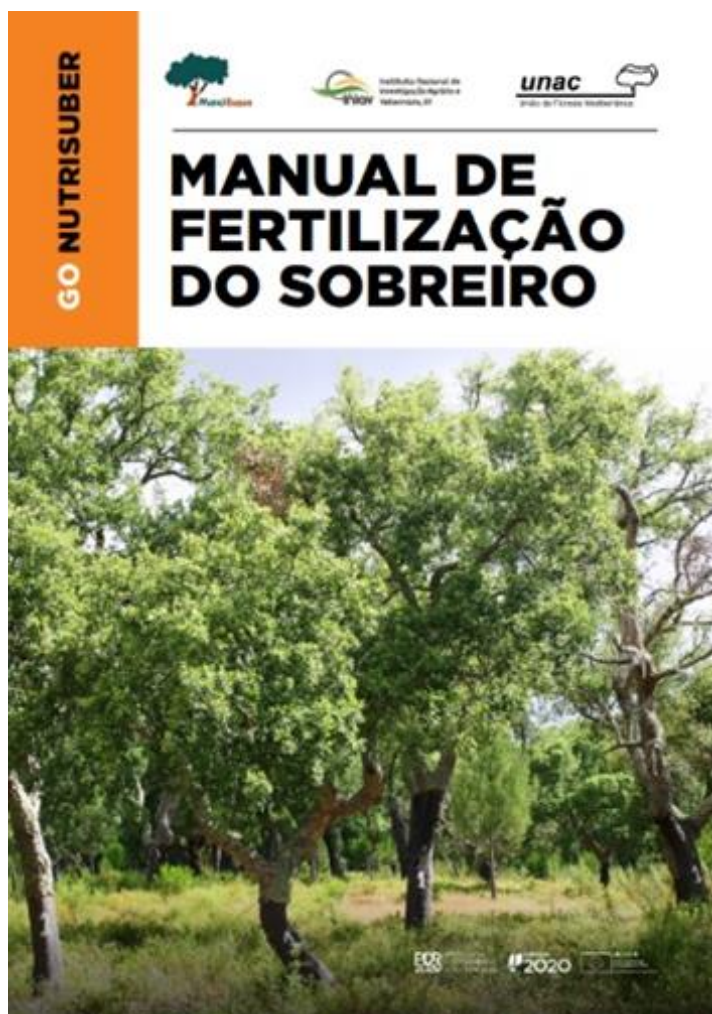


Figure 1. Published scientific material related to the project.

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The information presented in this factsheet was developed by the FOREST4EU partner, drawing on the innovations and knowledge generated by the indicated operational group with their explicit authorization.

## Further information

<https://www.inia.pt/images/publicacoes/livros-manuais/MANUAL-DE-FERTILIZACAO-DO-SOBREIRO.pdf>

<https://www.unac.pt/index.php/id-i/grupos-operacionais-accao-1-1-ndr2020/nutrisuber>





**Funded by  
the European Union**

Funded by the European Union (Grant n. 101086216). Views and opinions expressed are however those of the authors only and do not necessarily reflect those of the European Union or REA. Neither the European Union nor the granting authority can be held responsible for the content.





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