

Impact of postponing cork extraction on the equivalent annual annuity stands characterized by different productivity and cork quality



Cork pile in Portugal. Credits: Joana Amaral Paulo

Keywords

NWFP

Scale

Objective

In Portugal, the minimum interval between 2 consecutive cork extractions occurring in the same tree is fixed by law as nine years. Postponing the cork extraction from the traditional nine years to more years is an option that results (or not) in a variation of the cork price (for the same structure of cork prices). Site productivity, cork thickness and quality, and discount rate contribute to the profitability of the farm, which may be evaluated, for example, by the equivalent annual annuity (EAA). The objective was to apply the SUBER model to evaluate the influence of the cork debarking rotation period (CDR) variation, from 9 to 11 years, on the EAA value of different stands, by analyzing the opportunity to increase the cork market price of the extracted cork.

Context

Cork thickness is used for the industrial classification of cork quality and is a determinant of its price. The increase of cork thickness results from the increase of annual cork growth and/or of the CDR. Landowners may decide to postpone cork debarking in the expectation of increasing cork width and, thus, its price. Cork sampling and the SUBER model are management tools that can be used to estimate cork thickness and support forest managers in the decision of the duration of the CDR. Applying cork sampling results to initialize the model allows the simulation of cork thickness evolution in the forthcoming years, followed by an economic analysis of the effect of postponing cork extraction, based on the EAA.

Results

- The EAA value is maximized by site index and cork quality and cork growth index distributions
- In stands characterized by high or medium site index and high or medium cork characteristics (quality and growth index), the scenarios considering discount rates of 0.5% and 2%, provide similar values of EAA, when postponing the debarking for CDR values to 11 years. Stands characterized by low site index or low cork characteristics presented lower, nearly constant, and in some cases, negative EAA values, irrespective of the CDR considered in the simulations.
- For the simulations carried out with a discount rate of 5%, the EAA decreases with the increase of CDR, indicating that the minimum legal value of 9 years for CDR should be applied.

(See Figure for details)

Future developments

Increased knowledge regarding the quantification of the impact of soil and topographic characteristics and management operations (e.g. fertilization) on cork growth and quality is needed. This knowledge may be included in the management and decision support tools such as forest growth models and simulators that should be accessible for managers.

Recommendations

Climate is known to affect cork annual growth and, ultimately, cork thickness. In recent years, an increase in the frequency of severe drought events was observed in Portugal. As a result, for the same debarking rotation period, cork thickness may show a decreasing trend that may negatively impact cork price.

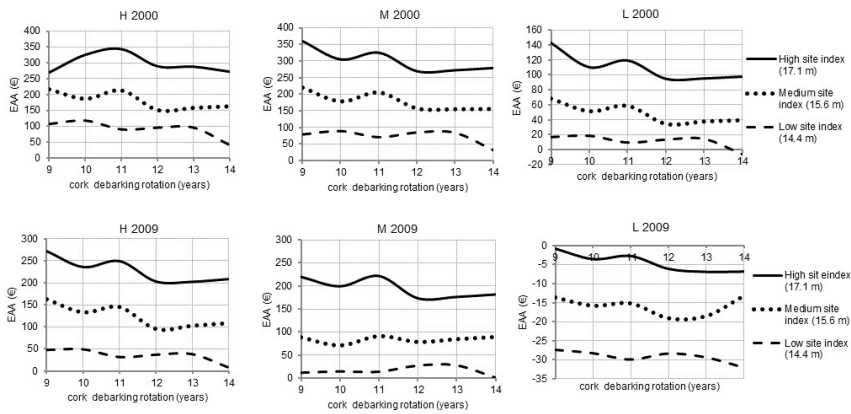
Among the essential parameters to assist the decision of delaying (or not) the debarking operation are:

- detailed knowledge of cork and stand characteristics based on the collection of cork samples in a forest inventory
- awareness of climate conditions during the period of cork growth, namely precipitation regimes
- collection of updated information on cork prices structure and work labor costs.

Impacts and weaknesses

Cork annual growth is known to be highly related to climate conditions, namely precipitation regimes, but it is also highly variable between and within farms/stands. The importance of site conditions such as soil depth and texture, management practices, and tree genetic variability implies that management operations, such as the cork debarking, should be decided based on monitoring activities such as forest inventory and cork sampling.

Cork price and labor costs fluctuations and uncertainty are also a relevant driver for farmers, which may affect the decision on the best time for cork debarking.



Equivalent annual annuity (EAA) for discount rate of 2% as a function of cork debarking rotation for stands with different site index (14.4 m, 15.6 m or 17.1 m). Cork prices structure from the year 2000 (high price scenario) is presented in the above part of the figure, and cork prices structure from the year 2009 (low price scenario) is presented below. H, M and L initials identify stands with high, medium or low fraction of good quality and thick corks, respectively.

Further information

Paulo, J. A., Tomé, M. 2017 Using the SUBER model for assessing the impact of cork debarking rotation on equivalent annual annuity in Portuguese stands. *Forest systems*. 26(1), e008, 11 pages.

<https://doi.org/10.5424/fs/2017261-09931>

Paulo, J. A., Pereira, H., Tomé, M. 2017. Analysis of variables influencing tree cork caliper in two consecutive cork extractions using cork growth index modeling. *Agroforestry Systems* 91(2): 221-237.

<http://dx.doi.org/10.1007/s10457-016-9922-2>

Author

Organisation

Instituto Superior de Agronomia (ISA)

Country and region

Portugal , Portugal

Contact

Joana Amaral Paulo,
joanaap@isa.ulisboa.pt

Margarida Tomé,
magatome@isa.ulisboa.pt

Rapporteurs

Name

Joana Paulo

Organisation

Instituto Superior de Agronomia (ISA)

Email

(hidden)

Published on

11 February 2020

About INCREDIBLE Project

INCREDIBLE project aims to show how Non-Wood Forest Products (NWFP) can play an important role in supporting sustainable forest management and rural development, by creating networks to share and exchange knowledge and expertise. 'Innovation Networks of Cork, Resins and Edibles in the Mediterranean basin' (INCREDIBLE) promotes cross-sectoral collaboration and innovation to highlight the value and potential of NWFPs in the region.

