
EURAF2020
NUORO
EURAF
European Agroforestry Federation
UNINUORO
L'UNIVERSITÀ AL CENTRO
5TH EUROPEAN AGROFORESTRY CONFERENCE
17th - 19th MAY 2021 - ITALY
BOOK OF ABSTRACTS
Agroforestry for the transition towards sustainability and bioeconomy

EURAF2020

New Business Models for innovating the cork sector and contrasting cork oak woodland abandonment

EURAF 2020
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Abstract
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Theme: Agroforestry and wildfire prevention

Keywords: Cork oak forest management, sustainability, Life cycle assessment, wildfire

Abstract

The traditional agro-silvo-pastoral system are characterized by wooded grasslands derived from human-induced transformation of forests by tree clearing and tillage. One of most common tree species of agro-silvo-pastoral systems in Sicily is cork oak (*Quercus suber* L.). According the regional inventory this species cover 18830 ha (Camerano et al., 2011) from sea level up to 600 m a.s.l. in siliceous and volcanic substrates. Traditional management of cork oak forest is an example of integration of sustainable land-use and biodiversity conservation. Cork oak woodlands are ecologically sensitive and maintained by active human management. Currently this ecosystem in the Mediterranean Basin is decreasing and it is threatening by poor or non-existent land-management practices. Especially, the Sicilian cork oaks are in decline and most of cork oak forests are not management, overexploitation of the land led to soil degradation and a lack of natural regeneration of cork oak trees. But the cork oak forest present a great potential, indeed cork is a multipurpose material used in many sectors, first the production of cork stoppers for the wine industry and other use as building materials (e.g. architecture, ship, fashion) moreover cork oak has other functions for example landscape value, improve the biodiversity.
In recent years, land abandonment is generally widespread throughout most of Mediterranean Basin, in particular the abandonment of practices of management conducts an invasion of shrubs and other oaks increasing the competition that also increases the vulnerability to wildfire. Sustainable forest management is the most important asset for cork oak conservation because this is maintained only through human use.
The aim of this work was evaluated the effect of recovery of degraded cork oak forest through sustainable management practices. The objective of management is to generate a stable structure for producing high quality cork with vigorous trees and promoting regeneration; the management strategy combines the cork production with fire preventions.
The practices for the recovery were selectived thinning, removing disease trees, scrubs management and the selective cutting of other trees (e.g. ash and other oaks). The products obtained from thinning, shrub clearing, and sanitary felling were used for firewood and woodchips.

In some cases it is necessary to plant new trees of cork oak, and also it is necessary to defend by grazing. The role played by shrubs is controversial, it is important to understand the relative importance of competing or facilitating effects of shrubs on cork oak for the successful regeneration. Also it is very important for the recovery of degrade cork oak, the stripping, this first obtained product will be poor quality but the next cork produced it will be better grade.
In this work we evaluated the ecological effects and the Life Cycle Assessment (LCA) of these practices. The LCA is a tool for the analysis of the energy balance and environmental impacts of a process from production to extraction of cork. The elimination of the shrub layer as well as favouring the development of the cork oak reduce the fire risk and the residues extracted are chipped and reused in the transformation process of cork. LCA was carried out to assess the environmental impact of management practices.

Figure 1. The photo shows how cork plants are totally invaded by shrubs that predispose them to the fire.

References:

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