



ITHub 5 – Agroforestry Systems

FOREST4EU partner: USC

OG: Operational group for the valorization of the  
Extremadura chestnut tree (CASTANEA)

OG's country: Spain

Type of Innovation: Process



## Model of a productive agroforestry system in Extremadura (Southwest Spain)

### Introduction

In Extremadura (Southwest Spain) there are around 11,000 hectares occupied by chestnut trees, most of which are traditionally managed as agroforestry systems with a mixed use of fruit production and other products. In this region, chestnut production has been used for both human and animal consumption, mainly pigs, sheep and goats. Usually, the animal consumption of chestnut fruits is carried out after the harvesting of the fruits with commercial value which reduces the incidence of pests in subsequent years. Moreover, in the chestnut groves located in flat areas, the understorey is also used to cultivate cereals, potatoes or pasture that is grazed by sheep.

### Objectives

One of the objectives of the CASTANEA operational group was to develop practices to transform abandoned chestnut groves into high-value productive agroforestry systems under a climate change scenario.

### Main results

The results obtained show that it is possible to transform chestnut groves for wood production into chestnut groves for fruit production. To do this, it is necessary to thin out the chestnut groves and select some trees, leaving a distance between trees of 10-15 m. The selected trees can be cut from the stump and when the trees are thin, they can be pollarded at 1.5 m and on the regrowth selected chestnut varieties can be grafted. The advantage of this procedure is the rapid production of chestnuts by the trees since already established and adult chestnut trees are used. However, the transformation of chestnut groves for wood production into chestnut groves for fruit production has an initially high cost because it is expensive to eliminate all the biomass from branches and trunks, and pollarded stems in the first years, which requires extra work to select the shoots. In any case, it is important to consider that chestnut fruit production is compatible with other uses through agroforestry systems, such as intercropping in the streets between trees, pasture production, wood from clearings or prunings, edible mushrooms, etc., creating synergies between the different products, optimizing resources and the management of the plots. Moreover, this product diversification strategy allows chestnut growers to obtain complementary income on the same plot, reduce inputs and production costs, and

in the case of new plantations, the return on investment is advanced, and the unproductive period of the plantations is reduced. Finally, it is important to take into account that the diversification of production can be carried out in established traditional chestnut groves and in new plantations. In both cases, the uses that will be carried out in the chestnut groves must be taken into account to design the plantation appropriately for the corresponding management.



Figure 1: Agroforestry systems established under chestnut trees in Extremadura (Southwest Spain).

## Lessons learnt

In the agroforestry system established with chestnut trees in Extremadura, the chestnut-cattle combination has been one of the classic associations with multiple mutual benefits (control of understory vegetation by livestock, improvement of soil fertility through nutrient recycling which reduces the use of fertilisers, pest control (Curculio and Cydia)...). Moreover, establishing horticultural, grain or forage crops in the rows between the chestnut trees is an interesting practice to develop in the new plantations. In this way the space is optimized, complementary income is obtained and the chestnut tree benefits from the work that the herbaceous crops receive. Chestnut trees can also be combined with the production of edible mushrooms, honey or firewood. Ecosystem services such as biodiversity or carbon sequestration are also higher in the agroforestry systems than in the exclusively agricultural and forest systems.

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

<http://gocastanea.eu/>



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