



**Wild cherry (*Prunus avium*)
for high quality timber**



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The European wild cherry (*Prunus avium*), belongs to the family *Rosaceae*, which includes the pear tree, apple tree and other fruit trees.

This species is widespread in Europe, West Asia and North East Africa, especially in areas with humid and warm conditions.

In areas with Mediterranean climate, wild cherry appears in shady, mountainous conditions, near water streams. In the Iberian Peninsula, they are located mainly in the North.



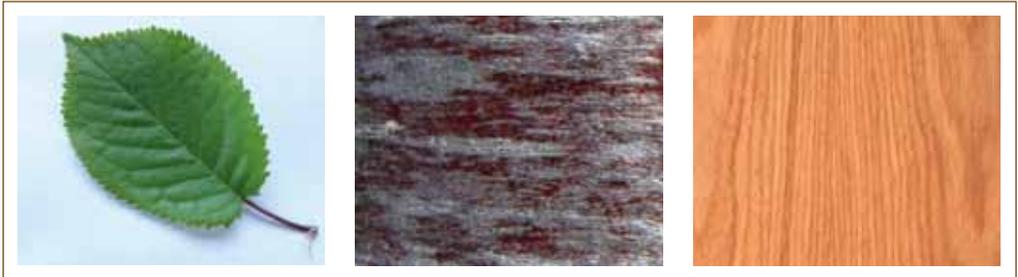
Distribution of wild cherry (Prunus avium). Source: EUFORGEN 2009.

Why planting wild cherry to produce timber ?

Wild cherry timber is one of the most valued in Europe. The top-quality pieces are used in the veneer industry, where they reach the highest price. In this industry, wood is cut into thin sheets that are used to cover top quality furniture. Wild cherry timber is also very appreciated as high-quality sawnwood.

Wild cherry shows a fast growth rate, that enables short rotations, between 40-50 years, always that they are well adapted to the site and adequately managed.

This species is a precious component of European forests, with a spectacular early flowering period that provides them a very high aesthetic value.



What are the main wild cherry requirements ?

In natural conditions wild cherry can adapt to a great variety of climates and edaphic conditions. Nevertheless, for achieving a successful plantation for high quality timber production it is necessary to utilize it at the most favourable conditions for this species. If these conditions are not adequately met, the plantation can lose its productive and economic interest, due to slow development and a higher risk of diseases.

The main ecological needs of wild cherry are summarized in the following graph:

	Comments
Soil depth (cm) 	A shallow soil hampers root development, leading to increased sensitivity to drought and wind-thrown (uprooting).
Texture 	Loamy textures are ideal for wild cherry. Because of their tendency to stagnate, clayish and compact soils must be avoided. On the other hand, sandy soils are not adequate because of their low capacity to hold water and nutrients.
pH 	Wild cherry appears in a wide range of pH, being especially suitable in sites rich in nutrients. It is thus recommended to avoid poor soils.
Altitude (m) 	Cold (and thus altitude) reduces annual tree growth. Late frosts or severe winters are not a problem for the production of valuable timber of wild cherry. However, this species is sensitive to intense snowfalls.
Mean annual precipitation (mm) Mean summer precipitation (mm) 	Wild cherry is very sensitive to drought, so those areas with persistently hot and dry summers must be avoided if artificial watering cannot be applied. A well distributed precipitation rate is preferable to a high annual rate unevenly distributed.

Water need	Sensitivity to temporary stagnation	Need for Ca, Mg, K	N and P need	Active limestone sensitivity	Wind sensitivity	Drought sensitivity	Competition for light sensitivity
High	High	Medium	High	Negligible or low	Medium to high	High	High

The best sites for wild cherry production are those well supplied with water but without risk of stagnation, protected from wind and drought. Some of the most convenient areas in Mediterranean conditions are valley floors and gentle slopes with a north or west aspect.



Wild cherry plantation in a mountain area.



Stagnation must be avoided.

Pest and diseases of wild cherry

Cherry trees are sensitive to attacks from insects, fungi and bacteria, although most of them can be avoided by keeping an adequate vigour: this is achieved through a correct choice of the vegetative material (species and provenance) to the site features. The following table shows the most common problems in plantations and the factors linked to their occurrence.

Pest	Diseases		Symptom	Timber defects	
Aphid (1)	Cilindrosporiosis (2)	Bacterial canker	Gummosis (3)	Core rotting (4)	Green vein (5)
Large, pure continuous plantations	Sensitive vegetative material	Excess of humidity or nitrogen	Mechanical damage on the tree	Too long rotation (60-70+years)	Genetic predisposition, areas with steep slopes and strong winds



Photographs 1, 2 and 3: Óscar Cisneros.

First steps of plantation

The first steps of wild cherry plantations are similar to those of other valuable broadleaved species.

Choosing the plant

It is recommended to use a plant material from an area similar to the plantation site, considering the soil features and the severity of summer drought. When using clones it is recommended to include at least 4 – 6 different ones to avoid health problems. Bare rooted plants are appropriate in high-quality soils. The plant must have a vigorous and healthy apical bud and a unique stem without branches. The root system must be well developed, with numerous secondary roots. One year-old plants (1+0) should be 50 - 70 cm high and have a base diameter of at least 1 cm, while two year-old plants (1+1) should be 125 - 150 cm high with at least 2 cm of base diameter.

Soil preparation

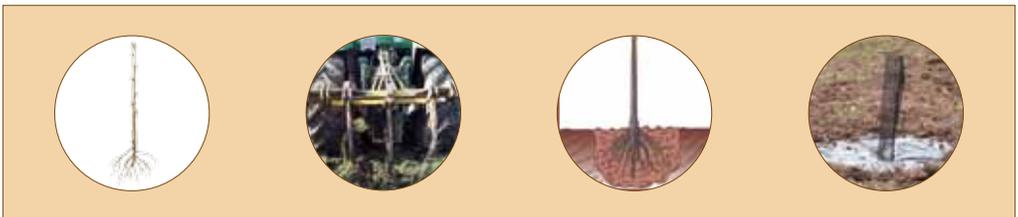
After clearing the vegetation that could impede or difficult plantation operations, it is recommended to apply a sub-soiling, preferably crossed (in two perpendicular directions) to the maximum depth possible (at least 50 cm), in order to enhance soil water retention. The plantation pits can be opened with backhoe excavator or with manual tools, with dimensions appropriate to the root system size.

Planting

The plantation is done during plant dormancy, normally between November and March. Days with frosts, precipitation or strong winds should be avoided. When planting, the root system must be displayed in a stretched manner, and should not be compressed. After filling the pit (keeping the tree vertical) it is recommended to apply an initial watering of 30-40 l/tree, if rainfall is not forecasted for the weeks following the plantation.

Protecting

Wild cherry is very sensitive to weed competition during the first 5-10 years of plantation. This negative effect can be avoided by mulching, preferably as individual pieces of 1 m². This technique impedes weed establishment in the soil near the tree. Browsing damage due to wildlife can be avoided with individual shelters (preferably with mesh wall, rather than solid wall), that can be complemented with an electric fence. Damages due to drought can be avoided or mitigated by emergency watering.



Plantation management

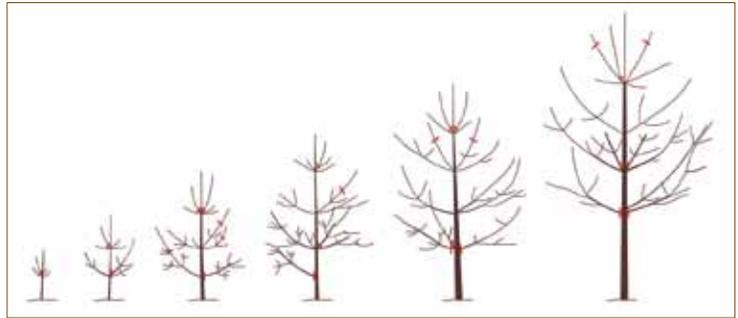
Wild cherry requires a dynamic and well planned silviculture. In order to limit management costs pruning will be applied to selected trees (vigorous, straight, vertical and free of defects) with potential to be promoted during the thinnings and to reach the final cutting. These trees should be selected and marked as soon as possible. The following scheme describes pruning and thinnings planning.

Pruning

During the **formative pruning** the forks and the high or vertical branches that can shade the terminal shoot are eliminated.

Quality pruning consists on eliminating those branches that have a diameter larger than 3 cm in their base, in order to avoid big knots. Both operations are applied simultaneously, during June or July, for preventing epicormic shoots development.

The severity of the intervention must be adapted to tree vigour, and should not lead to the removal of more than 30% of leaves in a single intervention. It is recommendable to clean frequently the pruning tools, for reducing the risk of transmitting diseases.

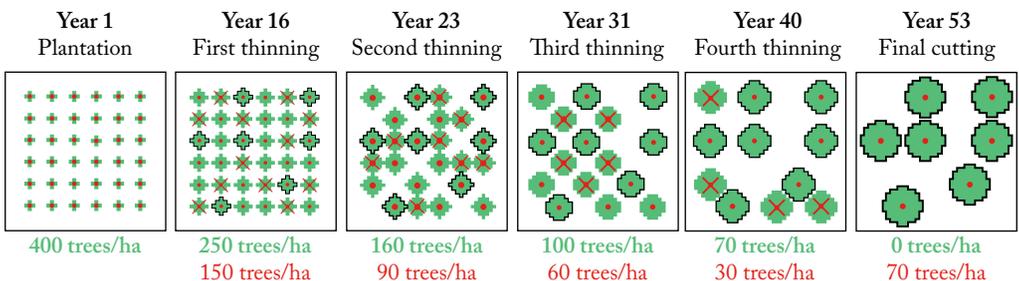


Pruning of a wild cherry during 6 years. Red marks indicate where to cut the branch.

Thinnings

Thinning consists on eliminating those trees that can compete with the best ones during the following years. Hence, top quality (selected) trees grow freely, at the maximum growth rate that the site quality provides. Thinnings should be moderate (eliminating around 33% of the trees in each thinning) and regular (every 7-10 years). The last thinning can be applied 10-12 years before the final cutting.

Thinnings planning on a plantation of 400 cherries/ha, in an appropriate soil (average target diameter at breast height: 50 cm).



250 trees/ha → Number of trees kept
150 trees/ha → Number of trees cut

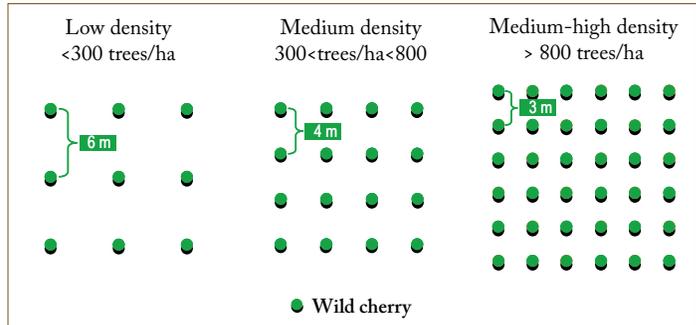
Future tree selected for final cutting
 Tree cut in the thinning

Plantation scenarios

There are many options for designing and managing wild cherry plantations. Each manager may adapt the density and composition of the plantation to the available management capacities (time and funds that are planned to invest) and objectives. Some possible scenarios are shown below.

Plantation density

In a plantation the initial investment depends largely on the initial density: low densities minimize initial expenses. On the other hand, the notable costs of high density plantations are partially compensated by an increased revenue from thinnings, and a reduced pruning effort as a result of lateral shading, that encourages the straight and vertical growth of the trees and limits the size and number of branches.

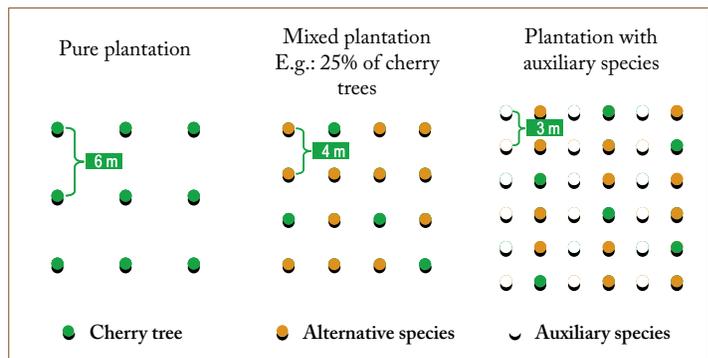


Plantation composition

Because of the sensitivity of wild cherry to pests and diseases, pure plantations are only recommended for small areas, with less than 1 ha. In the case of larger areas, it is recommended to mix it with other species.

The most adequate species to utilize in mixed plantations with wild cherry are other valuable broadleaves, preferably from families other than *Rosaceae*, in order

to avoid possible transmission of pathogens. Plantations with “auxiliary” species consist on using fast growing trees near the valuable broadleaves for providing a lateral shading that “educates” them during the first years. The modality promotes an adequate shape of the bole, with a reduced emission of branches, providing a protection against wildlife, wind and sun.



Example of silviculture model for wild cherry

There are many possible silvicultural schemes for wild cherry plantations. The frequency and intensity of pruning and thinning operations depend on site quality, plantation density and the technical capacity of the manager. The silvicultural model shown below refers to a 1ha pure plantation in appropriate soil, meeting all the species requirements. The figures of diameter and height growth come from different growth models; expenses and revenue are estimated based on real costs of plantations and market prizes. Profitability is expressed as the Internal Rate of Return (IRR).

Age (years)	Height (m)	Diameter (cm)	Intervention	Quality volume cut (m ³)	Expenses/revenue (€)
-1			Soil analysis. Vegetation clearing. Soil preparation.		-830
0-1			Plantation marking and pit opening. Vegetative material purchase. Plantation of 400 wild cherries (5x5 m frame). Mulching (1m ²) purchase and installation. Mesh shelters (60 cm) purchase and installation. Initial or emergency watering.		-3,000
2-6	1,5-2,5	2-5	Annual formative pruning (all trees). Possible emergency watering.		
4-9	3-5,5	6-13	Pre-selection of 150 trees/ha with potential to reach final cutting. Annual formative and quality pruning of pre-selected trees. Possible emergency watering.		-1,690
10-14	6-8	15-20	Final selection of 70 trees/ha to reach final cutting. Annual quality pruning of selected cherries, up to 4,5-6 m.		
16	9	18	Thinning, keeping 250 trees/ha, including those selected.	7.6	0
23	12	25	Thinning, keeping 160 trees/ha, including those selected.	15.5	+77
31	16	33	Thinning, keeping 100 trees/ha, including those selected.	36.5	+2,043
40	19	41	Thinning, keeping the selected 70 trees/ha.	33.6	+4,412
53	22	50	Final cutting of the selected 70 trees/ha.	116.0	+30,224
IRR					4.10%



Centre de la Propietat Forestal

Torreferrussa

Carretera de Sabadell a Santa Perpètua, Km 4,5

Apartat de correus 240

08130 Santa Perpètua de Mogoda

T. 93 574 70 39

F. 93 574 38 53

cpf@gencat.cat

<http://www.gencat.cat/cpf>

Authors of the specie booklet:

Jaime Coello (CTFC), Violette Desombre (CTFC), Jacques Becquey (IDF), Pierre Gonin (IDF), Jean-Pierre Ortisset (CRPF), Teresa Baiges (CPF), Míriam Piqué (CTFC).



Generalitat de Catalunya
Departament d'Agricultura, Ramaderia,
Pesca, Alimentació i Medi Natural



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