

THE LOIRE VALLEY, BIRTHPLACE OF THE FINE GRAIN SESSILE OAK



Office National des Forêts



Pedunculate oak



Sessile oak



## WHAT IS FINE GRAIN ?

The fine grain oak corresponds to oak wood reaching a slow and regular growth with a ring width not above 2.5 mm. Only high silviculture management can grow fine grain oakwood.

The two main species in France are the sessile oak and the pedunculate oak. They are very similar, but with very different chemical features. The sessile oak has great aromatic qualities and less tannin whereas the pedunculate oak is very rich in tannins and less aromatic.

### SESSILE OR PEDUNCULATE OAK ?

Nothing can be more competitive than the sessile oak. Why ? Unlike the pedunculate oak, the sessile oak thrives on poor soils and can bear the summer droughts. This characteristic slows down its growth in summer and contributes to the thinness of its annual rings, particularly in dense stand forests.

In France, the fine grain oaks are sessile oaks.

# THE LOIRE VALLEY, BIRTHPLACE OF THE FINE GRAIN SESSILE OAK

The world best quality wine is matured in fine grain barrels. The specificity of these barrels gives alcoholic beverages, such as the world famous Cognac, their unique typical qualities. This symbiotic union between content and container gives this precious nectar its final bouquet.

# A SPECIFIC BIOGEOGRAPHICAL CONTEXT

## LOW RAINFALL

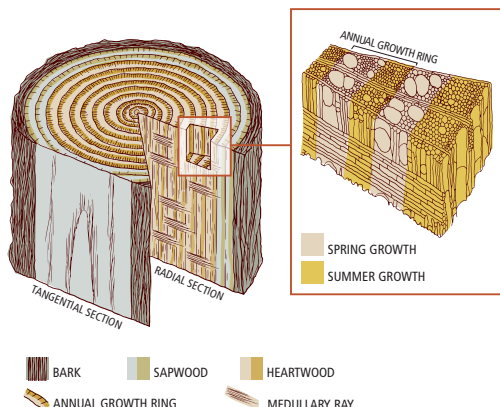
The Loire valley is characterized by its low rainfall, particularly in summer. Being in competition with agriculture, forests have to grow on less fertile soils. These conditions are favorable to the sessile oak as they also limit the growth of its annual rings. One can conclude that the Loire valley offers all the very best conditions for the growth of the sessile oak.

## FINE GRAIN OAK, A DIFFERENTIAL GROWTH IN SPRING AND SUMMER

Each annual ring consists in two parts : the spring growth portion, and the summer growth portion. The spring growth ring is mostly porous and reflects the growth period when sap is flowing quickly from the roots to the top of the tree. It needs to be porous to let the sap flow through.

The summer growth is less porous and denser, reflecting the amount of fiber and cellular tissue the tree is able to store as a result of the photosynthetic activity of its leaves. The spring growth portion in a single tree is fairly constant in size from year to year while the summer growth portion varies with the climate conditions.

The Loire valley has all the conditions to limit the summer growth of the sessile oak. All the more as this oak tree happens to be the most drought resistant oak.



# THREE CENTURIES OF UNCEASING MANAGEMENT SINCE COLBERT

The French state forests of the Loire valley have a long tradition of regular high woodland management which has continuously been applied by the Forestry Administration first, and later by the O.N.F. i.e. the National Forestry Agency .

When facing the ruined French forests, due to centuries of deforestation, Colbert, Louis XIV's Finance Minister decided to preserve a part of each Royal Forest in order to supply shipbuilding timber for the French Navy. This strategy produced some exceptional forests which were harvested in the 19<sup>th</sup> century, hence the high reputation of forests such as Bercé and Tronçais. But these efforts to regenerate the French forests did not last long.

It is only in the second half of the 19<sup>th</sup> century that the discovery of a new energy resource, i.e coal, reduced the need for firewood. This led to the improvement in regular woodland forest management.

The National School for Forests Management was founded in 1824, from which a new generation of foresters appeared. In 1827, the French forestry laws were passed.

In the early days, forest management was reduced to its minimum. Foresters progressively began to thin the forest crops, but because of a lack of technical references, these operations remained very limited. Indeed the oaks harvested nowadays have very thin annual rings, but also a large proportion of secondary quality timber: the lack of understory vegetation has produced narrow-trunked and low-branched trees. These oaks, grown in dense forests, have poorly developed foliages and are vulnerable to climatic uncertainties, a problem that may become more acute with the global climate change. Finally, the diameter at the rotation age was approximately 50 to 60 cm, which is rather inadequate to obtain enough stave wood necessary for the production of barrels.

Colbert was the first statesman with a strategic vision for the forest.



The highwoodland forest management consists in growing same age trees and in regenerating them when mature. This natural regeneration follows a natural process from the acorns, (the oak nut), growing into a new generation of trees, thus keeping the gene pool.



## MANAGING TODAY...

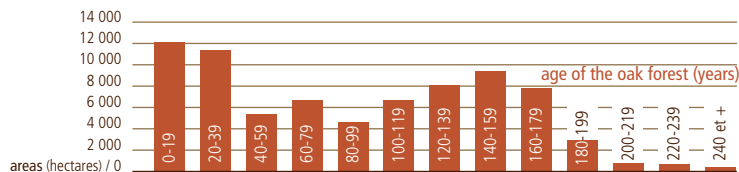
After a long period of growth, the state oak forests have now reached an optimum which enable to harvest the production. Contrary to the widespread popular belief, our oak forests have never been as rich in timber as they are today. The areas of 120 to 180 years old forests are particularly large, but they are unevenly distributed, due to their respective histories.

One of the main forest management guidelines was the research in the age-group balance in each forest. The strict enforcement of this principle has led to regenerate trees that are too small in certain forests, and too old in others, however they should have been harvested earlier before they decline.

ONF guarantees consistent supply of oak by regular smoothing of the harvests.

In order to optimize this rich heritage, the National Forest Agency has developed a management of the production basin in the Loire Valley as a whole .Nevertheless, foresters maintain old trees in all the forests. This management strategy guarantees a stable annual harvest for the next decade with a regular supply of timber oak more than 50 cm in diameter, which corresponds to the availability of oak stave.

### AGE-GROUP DISTRIBUTION OF THE OAK FORESTS



### SHORT AND LONG TERM SUPPLY PERSPECTIVES

- Maintaining a regular annual harvest of oak more than 50 cm in diameter in the Loire Valley.
- A progressive increase in diameter of harvested regenerated oak which has already been observed for a few years.
- A significant increase in the harvest quality in the following decade.



## ...AND DEVELOPING THE FOREST OF THE FUTURE

The research led by scientific organizations as well as the forester feedbacks allow us to consider silviculture in regular woodland high forest in a more dynamic way. The goal being to improve the production and to respond to the challenges due to climate change.

### MAIN DIRECTIONS

- To grow wood of a bigger size having the same age (70 to 80 cm for 180-200 years)
- To thin crops at an earlier stage when the core of the tree will not be used.
- To favour understorey vegetation to protect the trunks and limit the growth of small branches and “picots” (buds developing around the tree leaving marks in the wood and spoiling its use as stave)
- To identify the final crop trees, the most beautiful trees meant to form the final crop, at about fifty years of age,
- To measure out the thinning to favor the crop of these final trees depending on the fertility of the soil in order to obtain a regular growth of 2 mm per year, without exceeding a 2.5 mm annual ring width.

Several decades will be necessary before one can see the benefits of these improvements in silviculture.

### AN OUTSTANDING VINEYARD IN THE MOST PRESTIGIOUS FOREST MASSIF

In the same way as what has been done in the forests of Tronçais or Bercé, the most beautiful crop will benefit from a specific management in order to stand as a “showcase” of the Loire valley oak forests : their exploitability age will be of about 250-300 years which will produce high quality wood with high width (80 cm and over). This type of management will take place gradually, aiming at taking up 3 % of the Loire valley oak forest within a century; only then the oak will be collected and renewed. There's no doubt that this exceptional products will be of a very high value and highly praised in this very distant future.

At 50 years of age, the most beautiful oaks are identified For over a century forester will take care of them.





About 600 000 barrels  
are produced  
in France each year.

## THE ALCHEMY BETWEEN WOOD & WINE : A RELATIVELY NEW DISCOVERY

Barrels haven't always been as prestigious as they are nowadays. At first, barrels were meant to carry liquids easily. A lot of research has been necessary until one realized that barrels have other advantages : they impart pleasant, constant and lasting qualities to the wine.


From 1500 in the 1970's to 300 000 in the 90's, 600 000 barrels are produced nowadays !

More studies reveal that the type of wood used clearly influences the organoleptic quality of the wine. The success around this is based on a complex alchemy which can change through time but is also based on the wood species chosen. Several types of grains have been determined : fine grain for the sessile oak and rough grain for the pedunculate oak.

There is a correlation  
between the annual ring  
width and the content  
of ellagitanins.







Studies prove the clear superiority of the wines matured in new oak barrels.



A third of the barrels used in the world are made in France.

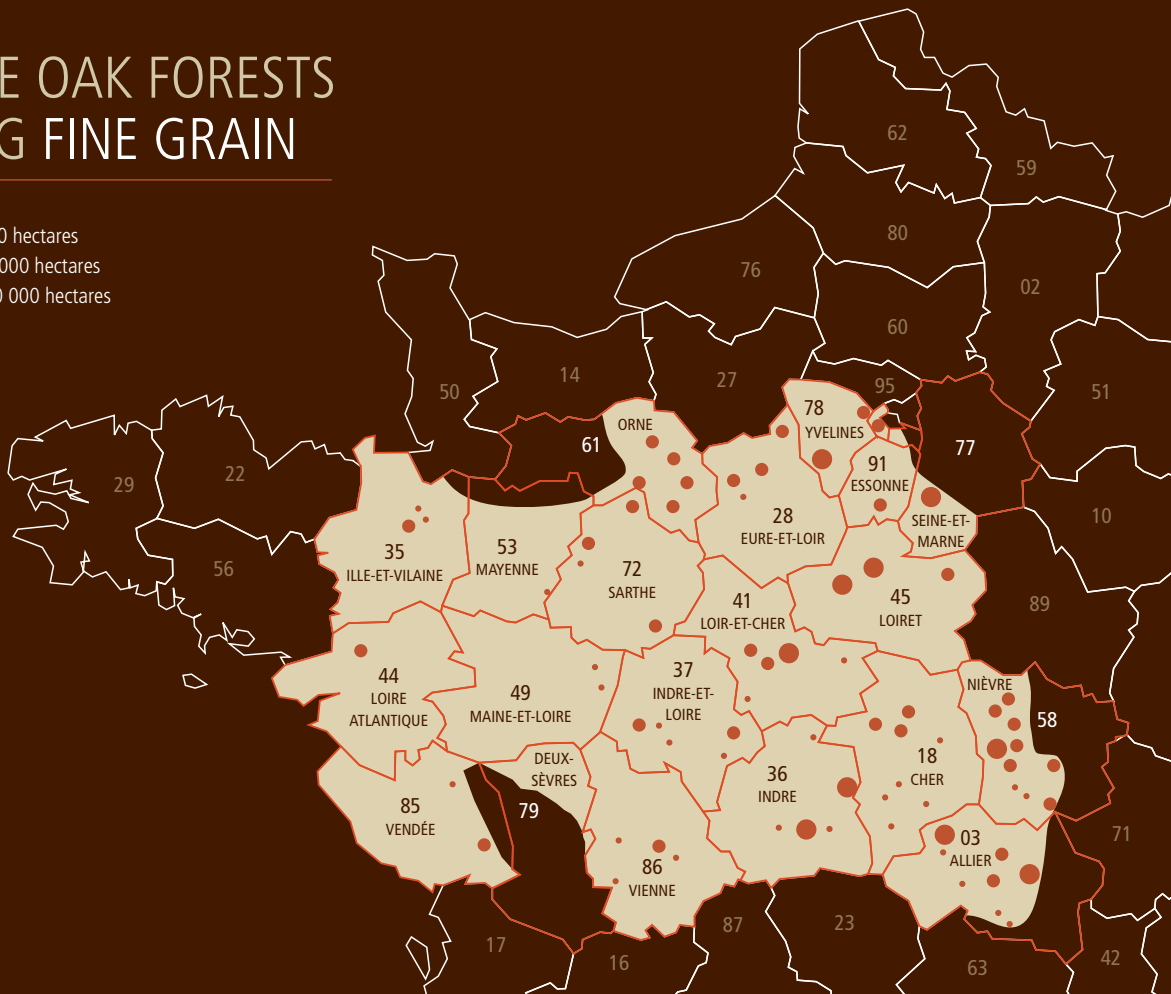
## THE COOPERAGE MARKET IS NOWADAYS DOMINATED BY FRANCE

Over the world, less than 2 % of the wine is matured in barrels. France produces about 600 000 barrels a year, which represents a third of the world production and a turnover of 390 millions €. 381 000 barrels, representing 64 % of the national production are sold abroad.

With a turnover of 264,4 millions € for the export, it is an industry with a positive balance for the French trade balance . Wines and spirits matured in oak barrels can be localized in 5 countries representing 80 % of the world trade. France remains first on this market just before the USA. Spain is third before Australia and Italy.

# MAIN STATE OAK FORESTS PRODUCING FINE GRAIN

- from 100 to 1000 hectares
- from 1 000 to 5 000 hectares
- from 5 000 to 10 000 hectares
- Loire valley area



Direction territoriale Centre-Ouest-Aquitaine

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