

LIGNUM.
MARIAUD CONSULTING

UNDERSTANDING WOOD

TO BETTER WORK IT



Our PROGRAM

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The different species of oak



**UNDERSTANDING
WOOD**

Stavewood is the result of a long cycle

- The oak used in cooperage grows for **150 to 200 years**.
- This wood does not come from opportunistic felling, but from **forest management planned over several generations**.
- Every step counts: soil type, density, orientation, thinning, and selection of future trees.




Mastering the workshop is not enough. You must also understand what happened beforehand.

Forest Management and Quality

- **The species:** sessile oak (fine grain), pedunculate oak (wider), American oak (more aromatic).
- **The management method:** regular high forest, selection of dominant trees, natural regeneration.
- **The age and growth** of the tree influence:
 - **the fineness of the grain,**
 - **the stability during toasting,**
 - **the richness in tannins and volatile compounds.**

Every forestry choice has a concrete impact on the final product.

A Tense Context that Requires Anticipation

-  **Climate change:** water stress, dieback, difficult adaptation of young plants.
-  **Rising global demand:** United States, China, high-end spirits.
-  **Less availability** of quality wood, longer supply times, rising prices.

Understanding forests and their constraints helps secure the upstream part of the industry.

What you need to know

- **1/3 of the French territory** is forested (17 million hectares).
- Around **75%** of French forests are **private**, **25% are public**.
- The size of the French forest has been **growing for over a century** (surface area has doubled since 1850).

Who manages the forests?

Type of forest	Manager	Specifics
Public forest	ONF (National Forestry Office)	State or communal forests. Sustainable management, mandatory development plans, timber sales by call for tenders.
Private forest	Private owners (individuals, companies, cooperatives)	Sometimes assisted by forestry experts, cooperatives (e.g., Alliance Forêts Bois), or the CNPF.

The Two Main Families of Trees

A. Deciduous Trees

These are trees with broad leaves, most of which fall in autumn (oak, beech, ash, hornbeam, etc.).

Uses: timber, stave wood, furniture, heating.

B. Conifers

These are trees with needles or scales, often evergreen (pine, fir, spruce, Douglas fir, etc.).

Uses: framework, construction, paper pulp, industrial wood.

Category	Share of french forest	Main species
Deciduous	About 67%	Oak (1st), beech, hornbeam, ash, poplar
Conifers	About 21%	Scots pine, spruce, Douglas fir, fir
Mixed (deciduous + conifers)	About 12%	Mixed plots, often in transition or reforestation

Key Figures

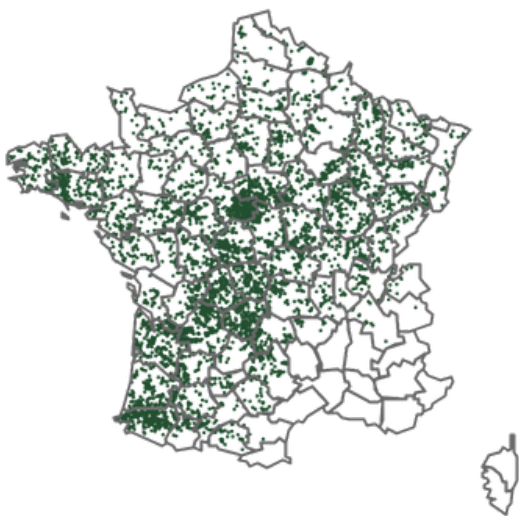
- Oak alone accounts for about 40% of the broadleaf surface area → It is the No. 1 species in volume and surface area in France.
- Conifer forests are more common in:
 - the Massif central,
 - the Vosges,
 - the Landes (industrial pine plantations)

For coopeage,

You will work almost exclusively with deciduous trees, and more specifically:

- **Sessile oak** (*Quercus petraea*): fine grain, highly sought after.
- **Pedunculate oak** (*Quercus robur*): more common, wider grain.
- Other deciduous trees (ash, acacia, etc.): sometimes used for trials or secondary purposes, but are in the minority.

*We also use American oak (*Quercus alba*, also known as white oak), a denser species with a distinct aromatic profile (vanilla, coconut, and toasted coconut), which grows mainly in the eastern and central United States, particularly in the Appalachian Mountains, Missouri, and Kentucky.*



Pedunculate oak



Sessile oak

The Main Types of Cuts and Forest Management

◆ Clear-cutting (or clearcut harvest)

- **Everything on a plot** is cut at once to allow for regeneration.
- It is often followed by **planting** or natural regeneration.
- This practice is controversial in deciduous forests, especially over large areas, due to its landscape and ecological impact.

✦ **Use:** *mainly in productive conifer forests (Landes, Massif Central, Vosges).*

◆ Regular High Forest

- All the trees are the **same age or close to it**.
- The stand is managed to **produce quality timber**.
- Trees are thinned regularly to favor the finest specimens.
- A final cut called a "**regeneration cut**" is then performed, and the cycle begins again.

✦ **Use:** *the preferred model for oak forests used in cooperage (Tronçais, Bercé, Bertranges, etc.)*

◆ Irregular High Forest

- A mix of trees of different ages on the same plot.
- The cutting is done tree by tree, based on their maturity.
- It promotes ecological diversity, reduces visual impact, and provides better climate resilience.

✦ **Use:** *increasing in use, often in private forests, but less common for stavewood (less control over the grain).*

◆ Coppice and Coppice-with-Standards

- **Coppice:** trees from stump sprouts, harvested on a short rotation (15–30 years), not well-suited for cooperage.
- **Coppice-with-Standards:** large high-forest trees above, with coppice underneath. A mixed system.

✦ **Use:** *often a transitional stage. These forests can be converted into a regular high forest.*

Current Distribution in France (Source: IGN)

Type of Stand	Estimated Share of French Forest Territory
Regular High Forest	About 30% (mainly in public forests)
Irregular High Forest	About 15 to 20% , increasing
Coppice-with-Standards	About 30% , often an old system
Simple Coppice	About 15 to 20% , little used for timber
Conifer Plantations	About 10% , very present in the Southwest

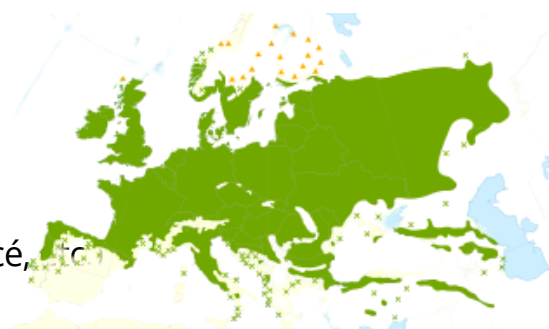
Key Takeaways for Cooperage

- **Regular oak high forest is the reference model** for producing stave wood.
- It allows for:
 - a fine and homogeneous grain,
 - controlled long-term management,
 - reliable traceability (ONF, PSG, etc.).
- Coppice and clear-cutting **do not provide the expected quality** for traditional cooperage.
- Irregular high forest is progressing for ecological reasons, but **requires more rigorous selection** for wood quality.

Sessile oak (*Quercus petraea*)

✓ Origin

- Western Europe (France, Germany, Austria, etc.)
- Very common in French state forests (Tronçais, Bercé, etc.)



🌿 Identification

- Leaves with a **long petiole**, without earlobes at the base
- **Sessile** acorns (directly attached to the branch)



🔺 Technical Characteristics

- **Very fine grain**, slow growth
- Homogeneous structure, ideal for **splitting**
- Rich in **ellagitannins** (structure, moderate bitterness)
- Slow open-air drying recommended (18–36 months)

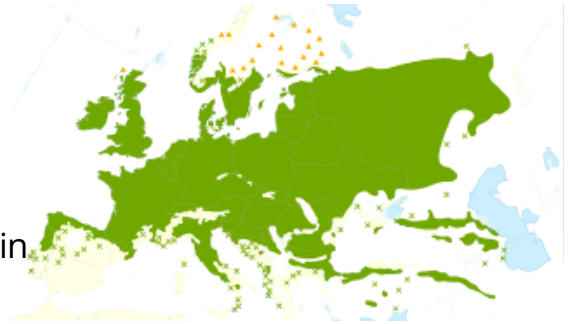
🍷 Interest for Cooperage

- Provides neutral, **elegant, and structuring** barrels
- Very well-suited for fine red wines and long aging periods
- **Sought after for finesse** and subtle wood integration

Pedunculate oak (*Quercus robur*)

✓ Origin

- Western to Central Europe
- Very widespread in France, often in wetter terrain



🌿 Identification

- Leaves with a **short petiole**, with earlobes
- Acorns with a **long stalk** (peduncle)



📐 Technical Characteristics

- More **variable** grain than sessile oak
- Faster growth → often less **fine wood**
- **Richer in tannins**, but **less homogeneous**
- Requires stricter selection for stave wood use

🍷 Interest for Cooperage

- Provides **more expressive and pronounced** barrels
- Provides more **tannic structure**
- Interesting for more powerful red wines, blends, or spirits.

White Oak (*Quercus alba*)

✓ Origin

- North America: mainly **Appalachian Mountains, Missouri, Kentucky**



🌿 Identification

- Lobed leaves, **short acorns**
- Wood with a **tylosis** structure (vessels blocked) → **waterproof even when sawn**



🔺 Technical Characteristics

- **Wider grain** but closed structure
- Can be sawn, no need for splitting → **better yield**
- **Fewer ellagitannins**, more **aromatic lactones** (vanilla, coconut)
- **Shorter drying** possible (12–18 months)

🍷 Interest for Cooperage

- Provides **more aromatic** barrels with a pronounced wood character
- Used for **fruity wines**, certain whites, and spirits
- Less suited for fine wines requiring great wood discretion



*Wood is a noble material
because it comes from a
long cycle. It's up to us to
respect it.*