FOREST4EU

ITHub 1 - Wood Mobilisation

FOREST4EU partner: CNPF

OG: CoolWood®

OG's country: France

Type of Innovation: Technological

Innovative method for maintaining the quality of round and processed wood by controlling temperature and humidity

Introduction

The biological degradation of wood is a permanent risk for the entire industry. From the time the trees are felled in the forest to the time the timbers are dried, the quality of the wood stored is constantly called into question by attacks of biological origin (fungi, bacteria, etc.). As a result, wood products can lose some or all their market value, and this problem is exacerbated in emergency situations (storms, epidemics, etc.).

Current wood protection techniques remain unsatisfactory.

There are currently three main techniques for maintaining wood quality:

- Wet protection (sprinkling, immersion); - Preservation by ensilage (under tarpaulin); - Chemical treatment.

None of them is fully satisfactory (lack of technical efficiency, constraints, high economic and environmental cost, etc.).

CoolWood®

CoolWood®: an innovative storage process: The CoolWood® process is a new technology for maintaining wood quality.

Logs are stored in an enclosure that is maintained:

- At a low temperature, to block the action of degrading biological agents;

- At a high level of humidity, to slow down the drying of round wood and prevent deformation (splitting and cracking).

CoolWood®: an industrial research programme: The development of the CoolWood® process was the subject of an industrial research programme from 2013 to 2017.

The programme, funded by the French National Research Agency (ANR) and the Lorraine Region, involved eight partners: four public laboratories (Université de Lorraine, AgroParisTech / INRA, CNRS) and four private companies (Biomasse Conseil, forestry cooperative F&BE, CDC Forestry Company, Inddigo).

Results and industrial applications of the process

The process maintains a better quality of wood than other methods (water spraying in particular) and the energy requirements of the process are relatively modest: 25 to 40 kW of maximum power demand for 1,000 m^3 of stored wood.

Four industrial applications have been identified for the "CoolWood®" process, at different stages of the supply chain, from logging to drying:

- Emergency storage, to manage emergencies caused by natural hazards;
- Logistics platforms, to organise the mobilisation of timber and regulate commercial flows;
- Logyards and industrial logyards, to maintain the quality of round timber;
- Sawn timber yards, to maintain the quality of wood after processing.

EIP-AGRI project (2022 – 2024)

The CoolWood® project is an Operationnal group of EIP-AGRI with the following partners:

- SARL Biomasse Conseil, owner of the process and the driving force behind its development;
- The forestry cooperative F&BE (Forêts et Bois de l'Est);
- Scierie Genet, which mainly processes beech, a species that is highly susceptible to degradation;
- SAS Cebi 45, a consultancy specialising in energy and thermal engineering.

In August 2023, an industrial cold room was installed in a sawmill for storing sawn timber.

We can disseminate the process in industry by creating turnkey installations.

Lessons learned

The added value of the entire timber industry is significantly reduced by attacks from biological agents that deteriorate freshly felled timber. After 5 to 6 months of summer storage, the depreciation of products sawn from these logs can represent up to 13 % for oak and 30 % for fir and spruce.

In France and Europe, we are witnessing a massive deterioration in the health of trees, which will have to be harvested at a rate higher than that of industrial processing. It will therefore be necessary to store large volumes of wood, but the technique most used until now - continuous spraying of wood with water - is encountering increasing difficulties as water availability decreases.

The advantages of the CoolWood® process over existing technologies (water spraying in particular) are: a better quality of the wood stored, a reduced raw material losses, a simplified logistics, an use of renewable energy sources, an environmental protection, more flexibility (variety of storage sites), an adaptability to the volumes to be stored, a self-sufficiency of the facilities (energy) and the possibility of visually assessing the wood

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

https://coolwood.fr/

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