

Innovative proceedings for the market uptake of European Walnut

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In the context of an economic transition towards a circular economy, the importance of wood as a resource grows rapidly. In technical terms, it is a renewable material able to store CO2. From a wider point of view, it is part of the natural landscape enabling industrial employment in rural areas.

These circumstances boosted the expansion of fast-growing species and intensive forest management models. Those choices lead to a cost-effective supply of biomass entering into the market, but they also conditioned the regression of traditional species which are part of the traditional landscape. One of those species is European Walnut (*Juglans regia*).

In a globalised world, fighting against market rules is a worthless effort. Therefore, the WOODNAT project focuses on developing knowledge and technology focused on the market uptake of European Walnut. According to the work plan of the project, those efforts are distributed throughout the entire value chain: from plants to trees, and later from trees to wooden products.



Figure 1. Walnut plants

Plants

The WOODNAT project developed technology for upscaling the production of plants. The action focused on European Walnut and Hybrid Walnut (combining *Juglans regia* and *nigra*). More precisely, the partnership concentrated its energy on trees for wood production. Note that Walnut wood has been registering high market prices for long time.

Figure 2. Walnut trees

The technical development included cloning walnut plants, which are a highly recalcitrant species. In order to achieve this challenge, extensive research on the proceedings and the auxiliary medias was carried out. As a result, the research performed by Dr Ricardo Licea in Spanish laboratories became a feasible industrial process at the facilities from Industrial Plants facilities in Bulgaria.

The research also included using fungi to improve the performance of the plants. This task was carried out by the Spanish company ECM. Their contributions led to more resistant plants which significantly reduced the cost per tree.

Another relevant contribution was possible thanks to the Italian partner CREA (Council for Agricultural Research and Analysis). The public research body provided its wide experience at the same time as contributing to improved performance of auxiliary means used during the nursery stage.

Trees

The WOODNAT project paid attention to testing forestry models allowing the long term plantations to be a profitable business for landowners. With this aim, different models were analysed in terms of outputs (quality and quantity) as well as the final balance (net profitability, risks and opportunity costs, etc.).

In Spain, the performance of intensive plantations of Hybrid Walnut was measured considering intermediate outputs such as the output from thinning as a potential income. In Italy, mixed plantations of Walnut and Poplar were considered for producing valuable intermediate material (Poplar for rotary peeling). A third model analysed was agroforestry based on Walnut. These are models where the production of wood is simultaneous to the production of feedstock.

Another action carried out within the project refers to implementing

technologies of information and communication for mapping the available resource of wood. The Spanish company WAF developed an app for WOODNAT. This tool promotes transparency among landowners, Walnut producers and industrials to get in touch.

Wood

The sustainability of European Walnut forests depends on the market uptake of products based on that material. This was the challenge for the industrial partners of the WOODNAT Project and the first results can be seen at stgnature.com, a website designed for WOODNAT exploitation.

As a result of the work done, veneer was successfully produced using intermediate thinnings from European Walnut as input. Those narrow veneers were later transformed into veneer faces under the design of SEISTAG. The strategy of mixing different species within the same board was applied to define innovative wooden surfaces.

Another achievement refers to modifying the colour of the veneer. Due to the light colour of raw material, different technologies were explored. One of the paths was vaporising the logs before slicing. Another was dyeing once sliced. Finally, direct digital printing was applied to finished products such as veneered boards. All those techniques contribute to bringing the *Juglans regia* closer to the *nigra*, which is the standard look on the market (Figure 3).



Figure 3. From *regia* to *nigra*, achieving the market standard appearance

SUMMARY

European Walnut is an autochthonous species growing in the south of Europe. Due to market rules, this species fades out from landscape. The WOODNAT Project developed knowledge and technology for turning the traditional European Walnut lumber and veneer into a competitive product for the market.

PROJECT LEAD PROFILE

Within the R&D department of Seistag, Dr Cueto has promoted the development of new products and processes for the forestry and wood sector. In the last seven years he has been directly involved in three patents and the market uptake of more than ten innovations.

PROJECT PARTNERS

The WOODNAT project grew around the topic of European Walnut. The collaboration involves nine organisations from five countries (Spain, France, Italy, Romania and Bulgaria). Seven partners are SMEs who collaborate with one public research body and one large company.

CONTACT DETAILS

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