



Mechanised resin extraction method

Introduction

The mechanized resin extraction system is proposed as an alternative to the traditional method in the study area that could be scalable at a national level. This method originated at the end of the 20th century in the USA, consists of drilling circular holes of different diameters and depths. The tissues in which the resin is stored (resin canals) are broken and the resin flows out as a consequence. In these holes, different resin collecting elements are installed, usually closed, unlike the traditional method.

Approach and main results

In this OG, the method is standardized with specific characteristics: the incisions are made with a circular drill with a diameter of 6 cm and in relation to the depth, bark and phloem are removed until reaching the depth where the xylem or wood begins, without penetrating it. Once the perforation has been made, a connector with a hermetic bag is introduced, which will allow the resin to be collected with a higher degree of purity. To improve production, a stimulant is applied to the exposed area. The resin flow starts immediately after stimulation and can be prolonged over a period of several weeks. This drilling operation will be repeated over the months of the tapping season (about 6) every 21 days on average (these two parameters can be altered depending on site conditions). In the first two wounds, a connector and a bag were placed (day 1 and day 21). From the third hole onwards, the bags are moved from the first to the third and from the second to the fourth and so on. Only 2 bags are used for the whole resin period unless a new bag is needed because the resin collected volume exceeds the capacity of the bag.

The main advantages of this method are:

(i) Resin with a higher turpentine content and a lower percentage of contaminations. (ii) Elimination of pre-extraction debarking tasks. (iii) Simplification of worker training, facilitating the incorporation of new resin workers. (iv) Reduction of physical effort, facilitating the incorporation of women. (v) Greater compatibility with timber harvesting and thinning activities.

Main disadvantages of the mechanized method:

(i) Higher investment in materials (bags, appliqués, drill). (ii) Management of waste (bags and connectors). (iii) Lack of industrial development for the transformation of resin contained in bags (iv) Lower production yields (gr/tree).

The results show a loss of production of around 20% compared to the traditional method measured in gr of resin per tree and season. This extraction method is still under study, but it is likely to become a reality in the short and medium term; for the moment, the mechanized method is not completely defined. The processing industries are not fully prepared to receive resin in bags due to the large amount of plastic waste generated and the complexity of the bag draining process, and there is still no clear market demand for a higher quality resin. In the light of these results, it should be noted that a full assessment of the cost-effectiveness of this mechanized process still requires an evaluation of factors that have not been taken into account, such as the execution times or the costs associated with each methodology. At the same time, the significant differences identified between the different study areas require increased efforts to assess the possible interactions with other climatic, soil or stand parameters that may explain the differences found. The project proposes the evaluation of such a technique in specific area and socio-economic contexts, as it is considered to be a good alternative to the traditional method in certain cases. However, the current results do not allow it to be considered as a mature method at present without taking into account the conditions described above.

Lessons learned

The generation of innovation in resin extraction processes requires long-term trials and a large number of individual specimens (trees) studied. Resin production is affected by numerous variables, including climatic, edaphic, dasometric and, of course, human factors. This means that in order to extrapolate an innovation in this field to different scenarios, it requires longer study periods than those currently provided by the OG. On the other hand, the complexity of scientific and technical cooperation has become manifest. Good communication of the real interests of the parties is essential for the success of these processes. On the scientific side, data collection in the field, which is carried out by the tapping workers, as well as the execution of the work, is essential to scientist work. Without reliable data, all research results will be useless. On the other hand, the researchers developing the experimental designs must know and communicate frequently and closely with the tapping workers or the designs cannot be realistically implemented.

Figure 1. Resin mechanical extraction system



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://vimeo.com/754512934/3447f5cb73>

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 <p>Funded by the European Union</p> <p>Funded by the European Union (Grant n. 101086216). Views and opinions expressed are however those of the authors only and do not necessarily reflect those of the European Union or REA. Neither the European Union nor the granting authority can be held responsible for them.</p>	 <p>cese4eu CORAZÓN FORESTAL, espíritu investigador</p>	 <p>GORESINLAB CENTRO DE INVESTIGACIONES EN LA ZONA FORESTAL</p>	 <p>FOREST4EU</p> <p> FOREST4EU Project  FOREST4EU Project  info@forest4eu.eu</p>	<p>Website</p> 
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