



Implementation of innovative forestry trials

Improvement at lower cost

Introduction

The stakes of a first thinning cut in a plantation are high. Thinning is necessary at around twenty years of age, in order to reduce the density in favour of future trees and thus encourage their growth in diameter. However, there are many delays in carrying out this first cut, with consequences for the quality of the stand (development of epicormics, stressed trees, etc.). The reasons given for this delay in thinning are the cost of the operation and the difficulty for owners to find skilled labour.

Various alternative solutions could make it possible to carry out these thinnings at lower cost. QD (qualification-dimensioning) silviculture, in particular, aims to designate a limited number of future stems in order to limit the number of interventions in the plot. One of the aims of the RAISON project was to assess the economic and silvicultural benefits of managing a young deciduous stand using low-density designation and routing compared with conventional silviculture based on full thinning.

Methodology and results

A property located in the commune of Valdallière was selected by CETEF members to set up a system on a 1.31 hectare plot, with the main species being common beech (75 %) planted in a mixture with chestnut (25 %). The planting pattern alternates between rows of 2 m and 4 m, making it easier to clear and prune the trees. In 2016, the trees ranged from 8 to 15 cm in diameter and 7 to 9 m in height. The stand has been subject to two successive reserve markings, the first aimed at favouring beech trees and the second at favouring future stems.

The plot was divided into 4 blocks of 0.3 ha, each allowing a different management method to be tested. Management method "a" was based on full thinning, "b" on low-density designation (QD silviculture) and clipping, "c" on low-density designation and ring-barking, and "d" was a control with no intervention.

There were no replications of any of the methods. To avoid the edge effect, the two outermost lines of each plot were not measured. The plots were marked with stakes and the isolation strips were marked with a line 1.30 m apart on the outside trees closest to the measurement plot. Future trees were also specifically marked. The variables measured were circumference at 1.30 m, a rating of the epicormic trees, and a description of the social status of the objective trees. The total height, the height of the base of the leafy crown, and the average radius of the crown are noted on the 10 largest designated stems. The stand is also monitored, with estimates of density, basal area and thinning. This estimate is made within a 10 meter radius of a designated tree near the centre of each plot. The data measured on the objective trees, the epicormic area, and the height of the 10 largest trees will be analysed to see whether the interventions maintain growth and whether the initial diameter is a true reflection of vigour, to see the impact of the interventions on the quality of the objective trees and to quantify the tree balance parameters.

Finally, monitoring the time and cost of the interventions, as well as the revenue generated, will enable an economic comparison of the different methods.

Lessons learned

35 to 40 "option" trees have been identified and marked out. They will be monitored individually until the final stand is harvested, ideally by taking measurements every three years at the beginning and then before each thinning. The first thinning of the "a" and "b" modalities and the girdling of the "c" modality was carried out in the 2nd half of 2022. Each sub-plot will be regularly maintained in accordance with the planned protocol. As tree growth is not linear over time, it is desirable for the monitoring of such an experiment to last until the stand is harvested. Of course, the experiment will produce results well before the harvest, but these results will only relate to the period measured and cannot be extrapolated over the entire life of the stand. Experimenting with different management methods is a long-term process for the forest and requires long-term sources of funding to enable the stands to be monitored.




Figure 1. Ringing of an aspen in favour of an oak.
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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://hautsdefrance-normandie.cnpf.fr/projet-raison>



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