FOREST4EU

ITHub 3 - Sustainable Forest Management and Ecosystem Services

FOREST4EU partner: CNPF
OG: PIF
OG's country: France
Type of Innovation: Process

Assessment of the drudgery of work during the planting phase

Introduction

In the context of climate change, planting appears to be a major tool for guaranteeing the adaptation and sustainability of forests, with species that will respond better to tomorrow's climates and provide a response to situations where natural regeneration is blocked. In recent years, planting has been given a boost with the introduction of the recovery plan, with the aim of planting 45,000 hectares in addition to the 50,000 hectares already planted annually. However, these operations are causing difficulties, as expressed by the various players, particularly forestry operators. Indeed, these operations are recognised as arduous and give rise to work-related illnesses and accidents, such as musculoskeletal disorders.

The aim of the PIF project was to develop plantation management methods that meet the social and environmental expectations expressed by stakeholders. One of the aims of the project was to identify the phases of work carried out by the workers during planting and to assess the arduousness of each of them, in order to identify possible recommendations for reducing this hardship.

Methodology and results

Seven work sites were monitored between the end of the winters of 2020-2021 and 2021-2022. The aim was to study contrasting work sites in order to assess the effects of different conditions on the difficulty of the work (posture, duration or number of strokes required to put the soil in the ground). Two or three workers were monitored and filmed for one hour. This monitoring made it possible to complete an evaluation grid and thus obtain an overall rating for the arduousness, duration and average number of movements for each stage of the planting process. The phases encountered during the various monitoring sessions include moving between each plant, stripping, digging the hole, planting and compacting. The average duration of a tree planting cycle on the various sites is 32 seconds. This time may vary depending on the site, the individual and the attention given to planting. The phases of making the hole and planting the seedling appear to be the most arduous and the most repetitive. Posture, but also repetitiveness and therefore the duration of the phases, are major factors in the arduousness. The different contexts studied do not seem to have had any major effect on the postures of the planters. This difficulty is accentuated when there are stumps, coarse elements or slash on the site. Mechanised preparation of the soil has a direct impact on reducing the number of strokes and therefore reduces the workload. Difficulties in moving around the sites, carrying heavy loads and the distance from the plant storage

area also increase the workload. The 'individual' factor is still the main result when it comes to the actual difficulty of the practices. This effect varies according to body size, age, level of experience in the job, but above all the 'manner' in which the work is carried out by the forestry operator. This could also be linked to the effort put into the pickaxe by the planter, which could not be measured during the study.

Lessons learned

The assessment of postures and durations highlighted the arduous nature of the act of planting, particularly when work sites are unprepared, in terms of slash management. Difficulties in moving around (no path in the plot or difficult access to it) combined with carrying heavy loads cause additional difficulties for the planter. The numerous trips to and from the planting site also make the work even more time-consuming. Preparing the planting site, when it is very cluttered (with many stumps or coarse elements), directly facilitates the planter's work. We can assume that slower work, with gestures that are sometimes more adapted, and less repetition of tasks carried out during and between days, would allow forestry workers to spare their bodies to a greater extent. Another lever could be to optimise the planting tool, in particular the pickaxe, which is the only possible tool on unprepared land. We can also work at plot scale and on the organisation of the work site, in particular by looking at the management of the seedlings, the cleaning of the plot and the clearing of paths for the planters. Following this study, technical sheets were drawn up to reduce the difficulty of the various stages encountered during a planting project.

Figure 1. Team of planters on a worksite.

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Further information

https://www.reseaurural.fr/centre-de-ressources/projets/plantations-innovantes-en-foret-innover-pour-installer-des-plantations

https://renfor.hub.inrae.fr/projets/pif

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