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ORIGINAL ARTICLE

Use of innovative technology for the production of high-quality forest regeneration materials*

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Abstract

The aim of this paper is to introduce the innovative technology created within the framework of PRE-FOREST project, funded by the European Commission under the CRAFT 6th Framework Research Programme. PRE-FOREST was an innovative research project in the field of forest planting stock material, enhancing co-operation between research foundations and small and medium-sized enterprises. Among the project's objectives were the introduction of a new technology based on precultivation (in mini-plugs) of forest regeneration material in a cost-efficient and environmental friendly production unit, not affected by outdoor climate; the development of a new, adapted to mini-plugs, grading technology and replug robot; the integration of these technologies into a functional prototype unit capable of large-scale forest regeneration material production; and the introduction of this production system at strategic locations in Europe. The system has been developed for year-round production and function in the same way, independently of climatic variations in different parts of Europe. To obtain these objectives the study focused on the interaction among production technology, mini-plug container design and rooting media, to develop cultivation protocols for forest reproductive materials of special economic and ecological importance for each participating country. One of the main benefits of the new technology was the environmentally friendly production of a large number of seedlings per square metre, leading to a cost-efficient result.

Keywords: *containerized planting stock, mini-plugs, nursery production, nursery robot unit.*

Introduction

Currently, three types of forest nursery stock are produced in Europe: bareroot stock, container stock, and a combination of container and bareroot stock, commonly called greenhouse transplant stock (Mohammed et al., 2001; Odlum et al., 2001; Ciccicarese et al., 2005). Traditionally in Europe much of the bareroot stock, the use of which has been decreasing steadily since the 1990s, is produced at government-owned nurseries, while container stock is chiefly produced by privately owned nurseries. The lack of capital investments for technical developments has implied a situation where cost

efficiency in the production of forest regeneration materials is low and often burdened with environmental problems. These also have a negative effect on the possibility of providing high-quality products to a growing market due to the commitment of many European countries to extend the forest area, to rehabilitate degraded forest ecosystems and to reclaim disturbed sites for forestry in an attempt to restrain the ongoing climate change and desertification (Weber, 2005). In Europe, important action in forest and environmental restoration is urgently required to combat natural degradation due to habitat, landscape and biodiversity loss. The industrialization and demographic forecasts also point towards an increased importance of reforestation activities on a continental scale. If this trend continues there will be future problems in supplying

* An introduction to the PRE-FOREST project covering presentations given at the final project conference.