



Nursery practices and field performance for the endangered Mediterranean species *Abies pinsapo* Boiss.

Rafael M. Navarro^a, Maria J. Retamos^a, Jose Lopez^b,
Antonio del Campo^c, Carlos Ceaceros^a, Luis Salmoral^a

^a Forest Department-ETSIAM-Cordoba University, Mail Box 3048, Cordoba 14080, Spain

^b Environmental Department-Junta de Andalucia, C/Mauricio Moro, 2. Malaga 29006, Spain

^c Departamento Ingenieria Hidraulica y Medio Ambiente, Universidad Politecnica de Valencia, Cami de Vera s/n, 46022, Valencia, Spain

ARTICLE INFO

Article history:

Received 11 August 2005

Received in revised form

18 November 2005

Accepted 30 November 2005

Keywords:

Morphology

Nutrients

Carbohydrates

Root growth potential

ABSTRACT

In the nursery production of *Abies pinsapo* there have been changes in container, growing media types, and fertilization in the last 10 years. In this research, five types of standard *A. pinsapo* planting stock were raised under different cultivation periods (2 and 3 years), growing media (soil-peat-organic soil mixture), and fertilizer applications (234, 339 and 397 mg of N). At the end of the nursery cultural treatments, the five planting stock types from the different treatments were morphologically and physiologically different. Five years after outplanting, seedlings grown from 3-year-old containerized stock were the tallest (averaging 38cm) and had an excellent survival (85-90%). However, 2-year-old containerized stock also showed a very high survival (80-100%) with similar height growth (averaging 32 cm). In the split plot analysis, survival was positively related to subsoil percentage in the growing media and fertilization. In term of morphological attributes of planting stock, height, diameter and height: diameter ratio seems to be negatively correlated to mortality. The results indicate that, in terms of field performance and seedling cost, containerized 2-year-old seedlings, 40% peat media and moderate level of N fertilization may enhance the field performance of *A. pinsapo* plantations and be a good initial point for new research to improve planting stock.

2005 Elsevier B.V. All rights reserved.

1. Introduction

Abies pinsapo Boiss. is a narrow relic species growing in the Sub-Betic mountains of southern Spain. Although spontaneous regeneration is possible in some areas by management techniques such as grazing control, seeding, etc. reforestation programs are needed in degraded areas, post-fire restoration, etc. As a result, there has

been an increasing need to produce vigorous, high-quality nursery stock of pinsapo fir trees. Several nursery cultural and post-planting treatments have

We are unable to supply this entire article because the publisher requires payment of a copyright fee. You may be able to obtain a copy from your local library, or from various commercial document delivery services.