

Root growth potential and seedling morphological attributes of four Mediterranean hardwood species

Tsitsoni K.T.¹, Tsakalimi M¹, Prodofikas Ch¹.,

¹Aristotle University of Thessaloniki, Faculty of Forestry & Natural Environment, Laboratory of Silviculture, P.O. Box 262, 54124 Thessaloniki, Greece

Corresponding Author: Tel +30 2310 992763, e-mail: tsitsoni@for.auth.gr

In many Mediterranean ecosystems due to large and longstanding human impacts, degradation processes are not local and extensive heterogeneous areas need to be restored. The lack of a reliable nursery practice to assess quality of planting stocks led to the failure of many reforestation and restoration projects. The rapid development of the underground and aboveground section of plants is a factor directly related to the success of plantings. Thus, it is important to develop a mechanism to evaluate nursery seedling quality and performance prior to field planting. Knowledge of the Root Growth Potential (hence RGP) and familiarity with the plant root system is a key to understand ecological fundamentals that influence seedling quality and subsequent growth. This study was conducted to evaluate two measures of RGP (number and length of new roots of first and second order), central root length and shoot morphological characteristics as seedling performance attributes of four Mediterranean hardwood species; *Cercis siliquastrum*, *Paliourus spinachristi*, *Quercus ilex* and *Pistacia lentiscus*, which could be used for reforestation and restoration projects. RGP and the other morphological characteristics were determined on two extraction dates (after 3 months from the sowing and 20 days later). Also, the existence of any correlations was investigated to determine whether a relationship exists between belowground and aboveground plant growth. From the results of the growth and the correlations of the morphological characteristics of the species, it could be assumed that the species *Pistacia lentiscus* and *Cercis siliquastrum*, which presented the highest RGP, will show better seedling performance. However, the RGP results should be interpreted cautiously when using them as an indicator of seedling performance potential, because the validity of the RGP as a measurement of seedling vigour is largely a function of site conditions and its predictive ability increasing as the site becomes harsher.