

Relationship between site index and some physical properties of calabrian pine

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Abstract

In this study, relationships between site index and some physical properties (e.g., air-dry and oven-dry densities, and volumetric shrinkage and swelling ratios) of calabrian pine (*Pinus brutia* Ten.) wood obtained from Kahramanmaraş state forests of Turkey were investigated. The results showed that these physical properties of the wood obviously decreased with increasing site index number, and there were good relationships between the physical properties of the wood and soil characteristics. The results of statistical analyses indicated that site index had an important impact on the physical properties. Significant differences in the air-dry and oven-dry densities between site index I and site indexes II and III were determined and there were significant differences in shrinkage and swelling ratio among all the types of site index (I, II, and III). Furthermore, differences in the physical properties of the calabrian pine among the site indexes could be attributed to different bedrock types and soil properties of sites.

ciated with soil properties. Therefore, it is important to know the site index of all the growing conditions. As yet, we have not found any studies on the relationship between site index and physical properties of calabrian pine.

Therefore, this study was aimed at investigating the relationship between site index and physical properties (e.g., density, and shrinkage and swelling ratios) of calabrian pine naturally grown in Kahramanmaraş state forests in Turkey.

Materials and methods

The selection of test areas and trees

Since the effects of site index on physical properties were essentially undertaken in the study, test trees were selected from test areas with the same properties (**Table 1**). Calabrian pine trees were obtained from the forests of the Sucati region within the borders of Kahramanmaraş province located in the southern part of Turkey. The selection of the test area and trees was carried out by following methods described in one of our previous papers (Bektas et al. 2003b). For each site index class, four

Calabrian pine (*Pinus brutia* Ten.) is naturally grown in Turkish state forests and, particularly, located in the Mediterranean, Eagen, Marmara, Middle, and Western Black Sea regions, as well as other parts of the world (Bektas 1997, Bektas et al. 1999).

This species has the largest growing area in Turkey among the other conifers, having the area of 3,096,064 hectares, which is equal to 15.3 percent of all the forest area in Turkey (Muthoo 1997, Asan 1993). Approximately 30 percent of the forest resource in Kahramanmaraş province in south-central Turkey is calabrian pine (Bektas 1995). It is also one of the woody raw materials com-

monly used by forest products industries (Bektas et al. 2003a).

It is well known that the dimensions and yields of products obtained from different age groups of trees depend upon site index and stand density. Knowledge of the productive capacity of forest land is a basic requirement for good forest management. Soil-site index studies showed that forest productivity is asso-

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Forest Prod. J. 55(1):45-48.