ISFOR 2017 International Symposium on New Horizons in Forestry
18-20 October 2017 | Isparta - Turkey
Poster presentation

# Comparative study of some standard and modern methods for volume estimation of standing trees

**Ramazan Özçelik[1,*], Şerife Kalkanlı[2], Onur Alkan[1]**

[1] Faculty of Forestry, Süleyman Demirel University, Isparta, Turkey
[2] Graduate Schools of Natural and Applied Sciences, Süleyman Demirel University, Isparta, Turkey
[*] Corresponding author: ramazanozcelik@sdu.edu.tr

**Abstract:** Brutian pine (*Pinus brutia* Ten.) is one of the most important ecological and economical tree species in Turkey. Presently, Brutian pine forests cover an area of about 5.9 million ha with a current standing volume of approximately 270 million $m^3$. Brutian pine is the most important conifer species from an economic point of view for the forest products industry in Turkey. Furthermore Brutian pine forests play a key role in providing important benefits and environmental services such as protection of soil and water resources and conservation of biological diversity in the South and West Regions of Turkey. Therefore, the information is necessary about growth and yield of the species for developing future management and planning strategies. The one of the essential building blocks in forest growth and yield prediction models is the equations for estimating individual tree volume. Volume estimation is an important issue to forest management and planning, to projecting regarding future of forest products industry, to monitoring the forest health and productivity and to estimating biomass and carbon stocks. Therefore, there is a need for volume estimation methods to accurately estimate standing tree volumes and combination with growth and yield models. In the present, tree volume of 250 standing trees estimated for brutian pine in the southwestern Turkey using two modern methods, Centroid and Paracone methods, and Hossfeld's Method. These estimates were compared with "true" volume of each tree bole which was determined by aggregating the volumes of measured short sections (average 1 m) using Smalian formula. The modern methods have been shown to be accurate approaches for obtaining the volumes of trees and logs when taper models are unavailable. On the other hand, although Hossfeld's method is older method, it is nearly identical to that for modern methods. Moreover, Hossfeld's method may be slightly simpler to implement in the field and like the modern methods, it can be used either for whole trees or for unmerchantable tops. However, in practice, convenience and economics play an important a role in the decision whether to use given estimation methods.
**Keywords**: Centroid method, Paracone method, Tree volume, Dendrometry